

MAY 19 1935

Minnesota State Medical Association Meeting, Minneapolis, June 24-26, 1935

# MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume 18  
Number 5

MAY, 1935

25 cents a copy  
\$3.00 a year

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# MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.*

Volume 18

MAY, 1935

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## VALUE OF CHOLECYSTOGRAPHY BY THE ORAL METHOD, WITH AN ANALYSIS OF 189 OPERATED CASES\*

EDWARD SCHONS, M.D., F.A.C.P.

*Saint Paul*

MUCH has been written on the use and value of cholecystography, as practiced both by the intravenous and by the oral method. Many series of cases have been reported in the effort to evaluate the procedures correctly.

The opinion for a long time was that the intravenous method is much more reliable than is the oral. This feeling has changed considerably, the oral method having come to be regarded in many places, as little, if any, inferior to the intravenous. It appears to be a fact that a normal gallbladder will usually show a fairly good shadow when the dye in liquid form is given by mouth, provided there is not a disturbed condition of the stomach sufficient to cause early vomiting of most of the dye, and provided there is no high grade pyloric obstruction.

It seems worthwhile to report the operative and pathological findings in 189 consecutive patients on whom the oral cholecystographic examination was done prior to operation. Several of the well-known liquid preparations on the market were used and a careful technic employed. The method of administration, time of taking the films, etc., have been modified slightly from time to time and the radiographic technic improved, with some improvement in the results.

All of the cases of this series were operated upon at St. Joseph's and Bethesda Hospitals, St. Paul, to the staffs of which I am indebted for the opportunity to present this study. Practically all had cholecystectomies performed. Most of the patients were operated upon soon after the cholecystographic examination, a few up to a year or more following the examination. A few were

examined more than once. In these cases the examination nearest the time of operation was used for the purpose of cholecystographic interpretation.

The following classification into which the cases were grouped appeared most serviceable.

1. Those showing a normal response: A clear-cut shadow of moderate size, of fairly good and uniform density, with prompt and marked contraction after food containing egg yolk and fat, without stone shadows or mottling limited to the gallbladder and without deformity. Sixteen cases (8.5 per cent).

2. Those giving a good or poor shadow, with positive or negative stone shadows or suggestive mottling which appeared to be limited to the gallbladder shadow, filling defects of any kind, distortion which was constant in character, poor contraction, or markedly delayed emptying. One hundred nineteen cases (62.9 per cent).

3. Those with no shadow which could be recognized as the gallbladder, with or without dense shadows characteristic of gallstones. Fifty-four cases (28.5 per cent).

### Absence of Shadow

I shall consider first the cases which showed no cholecystographic shadow, interpreted as non-functioning gallbladders. Of the fifty-four cases in this group, thirty-five (65 per cent) showed stones at operation.\* In only six cases of this group (11.1 per cent) were the stones dense and positively identified in the roentgenograms. Ten additional patients, who had definite stones

\*Read at the joint meeting of the Minnesota Radiological Society with the Minnesota State Medical Association, at Duluth, July 16, 1934.

\*One of these contained gritty material, without definite stones.

at operation, showed faint or more or less marked mottling in the gallbladder region. The interpretation in these cases varied from somewhat suggestive of stones to probable stones. Only one additional case, considered suggestive of stones in the cholecystograms, failed to show stones at operation. In nineteen cases the stones were completely non-opaque and showed no evidence roentgenographically. Nineteen (35 per cent) of the non-visualized gallbladders showed no stones at operation.

Most of the cases of the non-function group showed at operation or pathological examination also other evidence of gallbladder disease. The pathological changes were most severe in the stone cases, but also occurred in most of the cases without stones. The pathological findings and their frequency of occurrence are shown in Table I.

TABLE I. OPERATIVE FINDINGS IN FIFTY-FOUR NON-VISUALIZED GALLBLADDERS

Findings	Cases
Stones .....	35
Adhesions to duodenum, colon, omentum, etc. ....	30
Large or distended gallbladder.....	27
Small, shrunken gallbladder.....	2
Injected or color changes.....	14
Wall thickened .....	18
Nodes along the ducts.....	3
Small papillomas .....	2

The more severe pathological conditions among these fifty-four cases were as follows: three cases, acute cholecystitis; one, acute necrotic cholecystitis, with cholecystoduodenal fistula; one, acute, with empyema; one, gangrenous; three, empyema; one, subacute. Stones were present in seven of these ten severely infected cases. Most of the remaining cases had an operative or pathological diagnosis of chronic cholecystitis, based on the presence of definite adhesions or one or more of the other gross findings, with or without microscopic evidence. In a few the changes were rather minimal. Two showed only cholesterosis.

In five cases which showed no cholecystographic shadow, other diseases than that of the gallbladder appeared to be the cause of the symptoms at the time. Table I (a) shows the gallbladder findings in these cases.

Many, but not all, of the gallbladders removed

were examined microscopically. Four of those examined showed little or no microscopic evidence of pathology. The findings at operation in these cases were:

1. Injected and distended gallbladder, with adhesion to duodenum and periduodenitis.
2. Gallbladder soft and thin walled, but surrounded by adhesions to duodenum. A gastroenterostomy was undone, no evidence of ulcer being present.
3. Wall thickened, probable cholecystitis. Strawberry mucosa on section after removal. Duodenal ulcer.
4. Gallbladder and ducts bound down by adhesions; gallbladder wall thickened.

It is seen from the above that all showed some degree of disease of the gallbladder or ducts, only one (No. 3) showing important extrabiliary pathology which may have been responsible for the symptoms.

#### Abnormal Character of Shadow

The abnormal shadow group, 119 cases (62.9 per cent) of the 189 operated cases, showed a poor shadow, with or without other cholecystographic evidences of pathology; or a fairly good shadow, but the presence of such other evidences of pathology as: definite stone shadows, mottling limited to the gallbladder, an abnormally large gallbladder shadow, distortion, poor contraction and emptying. Sixty-nine (58 per cent) of the patients in this group had stones at operation. Eleven (9.2 per cent) had stones which were more or less opaque in the roentgenograms; twenty-three (19.3 per cent) had definitely non-opaque stones. These thirty-four all showed stones at operation or after opening of the gallbladder. One additional case, which was reported as showing stone shadows, showed no stones at operation. Reexamination of the films of this case shows no shadows which would warrant a definite diagnosis of stones, only slightly suggestive mottling being present in one or two films. A total of thirty-four (28.5 per cent) of the cases in this group were thus definitely and correctly diagnosed as stones; eighteen more showed mottling, ranging in interpretation from questionable to probable. In eleven additional cases, mottling suggestive of stones was thought to be present, but no stones were found. Of the total of sixty-nine cases in this group, in which stones were found at the



# CHOLECYSTOGRAPHY BY THE ORAL METHOD—SCHONS

TABLE I (a). CASES OF NON-VISUALIZATION WHERE DISEASE NOT IN THE BILIARY TRACT WAS THE CAUSE OF SYMPTOMS

<i>Extrabiliary Diseases</i>	<i>Gallbladder Findings</i>
Appendicitis and penetrating duodenal ulcer	Adhesions, very thick gallbladder wall.
Duodenal ulcer	Microscopically, chronic cholecystitis.
Low grade appendicitis	Thick-walled gallbladder, strawberry mucosa. No marked microscopic change.
Low grade appendicitis	No gross changes, but gallbladder removed. Microscopically, low grade chronic cholecystitis.
Acute appendicitis*	Gallbladder distended and does not empty. Microscopically, chronic cholecystitis.
	Gallbladder very large and adherent. Microscopically, chronic cholecystitis.

\*Autopsy showed carcinoma of cardiac portion of stomach. Stomach had not been examined roentgenologically.

operation or after section of the gallbladder, in fifty-two (75 per cent) a positive or suggestive diagnosis by cholecystography was correct. In nineteen cases (15.9 per cent) of this group in which stones were found at operation, their presence was not surmised from the roentgenograms. Fifty (42 per cent) showed no stones at operation.

Most of the cases showed some type and degree of pathological change. The various pathological changes, as would be expected, were more marked and frequent in this group in the stone cases than in those without stones (as was found in the group of cases showing no cholecystographic shadow), but these changes were also frequent where no stones were present.

Table II shows the more important and frequent changes which were found at operation or upon section of the gallbladder in the poorly functioning group.

TABLE II. OPERATIVE FINDINGS IN ONE HUNDRED NINETEEN POORLY FUNCTIONING OR ABNORMAL SHADOW CASES

<i>Findings</i>	<i>Cases</i>
Stones .....	69
Adhesions to duodenum, colon, omentum, etc. ....	53
Large or distended gallbladder.....	23
Small, shrunken gallbladder.....	2
Injected or color changes.....	15
Wall thickened.....	38
Nodes along ducts.....	8
Papillomata .....	2

As in the nonfunctioning group, most of these were recorded with an operative or pathologic diagnosis of chronic cholecystitis. Three had a diagnosis of acute cholecystitis; three, subacute

cholecystitis; one, empyema with gangrene. In nine there was only a strawberry gallbladder, but two of these contained stones and one a soft, yellow mass, considered the beginning of a stone. Two had carcinoma of the gallbladder; one, carcinoma of the liver; one, hepatitis; one, large, fibrotic right liver lobe.

Important extrabiliary pathological conditions were found in eleven cases. The operative gallbladder findings in these cases are detailed in Table II(a).

The presence of microscopic evidence of cholecystitis does not appear to be an absolute index of the grade of disease present. As in the no-shadow group, but occurring much more frequently, there were cases which showed very little or no microscopic evidence of disease, but marked operative evidence of disease. Some of these cases were:

1. Filled with stones. Very thick gallbladder wall.
2. One stone.
3. Soft stones. Papillomas.
4. Gallbladder twice normal size, buried in adhesions to omentum, duodenum and colon.
5. Large, thick walled gallbladder. Operative diagnosis, chronic cholecystitis.
6. Subacute cholecystitis, dense adhesion.
7. Gallbladder very large, thick walled, subserous deposit of fat.
8. Gallbladder adherent to transverse colon and omentum, somewhat thickened.
9. Thick wall, large glands along ducts, marked subperitoneal deposit of fat.
10. Considerably enlarged, somewhat thick, cannot be emptied.

# CHOLECYSTOGRAPHY BY THE ORAL METHOD—SCHONS

TABLE II (a). CASES OF ABNORMAL CHOLECYSTOGRAPHIC SHADOWS WHERE IMPORTANT EXTRABILIARY DISEASE WAS PRESENT

<i>Extrabiliary Disease</i>	<i>Gallbladder Findings</i>
Acute pancreatitis	Cholecystitis with adhesions
Duodenal ulcer	Gallstones
Duodenal ulcer	Gallbladder adherent to duodenum and transverse colon
Appendicitis	Gallstones
Appendicitis	Soft mass in gallbladder, beginning of stone. Early cholesterosis
Appendicitis	Gallstones
Appendicitis	Gallstones
Appendicitis	Dense adhesions, right upper quadrant, binding down common duct
Appendicitis	Gallstones
Appendicitis	Large gallbladder; did not empty; adherent to stomach
Mucocele of appendix	Gallstones

## Normal Shadow

The normally functioning group is a small one, not because a normally functioning gallbladder is infrequently found by cholecystography, but because no cases found normal are operated upon, unless clinical evidence of gallbladder disease sufficient to outweigh the negative cholecystographic findings is present, or unless there is other upper abdominal disease requiring operation, during which the gallbladder region may be explored. Lower abdominal operations do not permit entirely reliable examinations of the gallbladder region, upon which to judge the correctness of the cholecystographic evidence, and I have therefore excluded one case where the gallbladder was examined during a pelvic operation, pronounced negative, and not removed. Opportunities to check up reliably on negative cholecystographic findings are thus seen to be comparatively infrequent. There are no cases in this group where an upper abdominal operation was done without removal of the gallbladder, while there are fifteen cases where the gallbladder was removed in the face of a negative cholecystographic report.

The findings in these cases are shown in Table III.

Of these fifteen cases, seven were recorded with an operative or pathological diagnosis of chronic cholecystitis; in one the diagnosis was cholesterosis. Five showed little or no microscopic changes.

The high percentage of disease is undoubtedly due to the fact that this group is small and constitutes a much smaller and clinically proportion-

TABLE III. OPERATIVE FINDINGS IN FIFTEEN CASES SHOWING NORMAL CHOLECYSTOGRAPHIC FINDINGS

<i>Findings</i>	<i>Cases</i>
Stones .....	2
Adhesions .....	8
Large or distended gallbladder.....	4
Color changes.....	3
Wall thickened.....	8
Nodes along ducts.....	5
Papillomata .....	1

ately worse fraction of the cholecystographically negative cases, than do the operated cases in the other two groups.

## Summary and Comment

The conclusions to be drawn from this analysis are clearly that the oral cholecystographic test, if properly applied, may be relied upon to indicate correctly the presence of disease of the biliary system in a high percentage of cases.

The presence of stones, associated with other pathological changes, in such a high percentage of the no shadow and abnormal shadow cases (65 and 58%, respectively), makes it logical to expect that a large additional percentage in each group should have symptom-producing pathological changes without stones. The operative findings recorded and the fact that the surgeon thought them sufficient to warrant removal of the gallbladder, confirm the value of the positive oral test, even if no stones are demonstrated, in indicating the presence of pathology, with or without stones. If the gallbladder does not function,

the probability of disease is very high. The probability of stones, visible or invisible, in these cases is high. If the gallbladder function is poor, the probability of gallbladder disease is high, but not as high as in the absence of any shadow. If a shadow is present, about 40 per cent of non-calcified stones, in addition to calcified stones, may be detected with certainty and the presence of stones in a further number may be surmised with some degree of probability.

If, on the other hand, the gallbladder shows a good shadow, the probability of the gallbladder being normal is apparently much more doubtful, in the presence of suggestive upper abdominal symptoms, than is the probability of disease be-

ing present in the other groups. The incidence of stones in this group (12.5 per cent) is low compared with the other two groups, but the incidence of adhesions and the other findings is high. All these pathological findings occur sufficiently frequently to indicate that more care should be given in following the response after the fat meal, as stones and other abnormality can be excluded with greater certainty if a markedly contracted shadow, in addition to an otherwise normal shadow, is obtained.

The fact that after the oral administration there were so many cases of a normal shadow in spite of later proven disease would appear to indicate that the greater sensitiveness of the intravenous method is not required.

## POSTOPERATIVE PULMONARY COMPLICATIONS AND POSTOPERATIVE USE OF THE TRENDLENBURG POSITION\*

HOWARD K. GRAY, M.D.

Rochester, Minnesota

THE fact that of patients who have pulmonary complications subsequent to operations within the abdomen, approximately one-half die, is impressive. Agents other than pulmonary complications which impose risk of prolonged convalescence or of death have been reduced nearly to a minimum through clinical investigation and research. The reality must be faced that pulmonary complications continue to constitute the greatest single hazard in abdominal surgery, and if death cannot be ascribed directly to them, not infrequently they so reduce the actual defensive forces that a fatal outcome ensues when recovery otherwise might have followed. The present low mortality rate in abdominal surgery is a tribute to the surgeons who have devoted their attention to this field, but if still further reduction in this mortality rate is to be achieved, every effort should be made to prevent the occurrence of pulmonary complications by meticulous attention to detail before, during, and after the operation.

### Etiology

The most widely accepted theory relative to the production of postoperative pulmonary complications is that which attributes the condition to aspiration of infected material. The use of general inhalation anesthesia undoubtedly predisposes to infectious intrapulmonary processes through the irritating effect on air passages. Thus, a medium is created in which this process may thrive. The fact that the incidence of pulmonary complications following the use of spinal anesthesia has been found to be nearly as great as that which follows inhalation anesthesia is difficult to explain. Not infrequently extreme nausea and vomiting are experienced by patients who have undergone spinal anesthesia and, with the increasing tendency toward combining this type of anesthesia with large doses of sedatives, the likelihood of aspirating infected material is increased. In general, inhalation anesthesia would seem to be best suited for surgical procedures in the upper portion of the abdomen and spinal anesthesia for those lesions situated below the level of the umbilicus. In the hands of an expert spinal anesthetist, operations may be sat-

\*From the Division of Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, Duluth, Minnesota, July 16, 1934.

isfactorily performed on the stomach and duodenum or on the biliary tract, with the patient under spinal anesthesia, without unwarranted risk. Intratracheal anesthesia likewise has been found to be suitable for surgery of the stomach and duodenum if the services of one who is skilled in the use of the intratracheal tube are available. The tube is chosen to fit the trachea snugly and rarely is material aspirated, and a clear airway is assured at all times.

Pulmonary complications infrequently are due to the production of infarcts in the substance of the lung by the lodging of emboli. The source of the embolus usually is in the field of operation, or in one of the veins of the pelvis or of the lower extremities. Emboli may vary in size from one scarcely large enough to cause symptoms to one of enormous size which may completely occlude the pulmonary artery and cause sudden death. Such a tragedy may occur with occlusion of one branch of the pulmonary artery, although both branches ordinarily are occluded.

In addition to the aspiration of infected material and to the lodging of emboli in the substance of the lung, infection may be carried through lymphatic channels. Higgins and Graham, and Lemon and Higgins have shown that particulate graphite, when injected directly into the peritoneal cavity of the dog, was readily visible in diaphragmatic lymphatic structures and in the sternal trunk within from ten to twelve minutes. The main collecting trunks of the diaphragm lie below the pleura on the muscle bundles, and it was noted that normal muscular contraction of the diaphragm contributed largely to the passage of the particulate matter. Operations, particularly in the upper part of the abdomen, are attended by a decrease in the activity of the diaphragm. Complete aeration of the lung is thereby inhibited, and a sluggish flow in the diaphragmatic lymphatic system is produced, both of which factors may predispose to pulmonary complications.

Partial or complete atelectasis may or may not be infectious in origin. The most widely accepted theory is that which attributes the condition to blockage of one of the main bronchi by a plug of mucus with subsequent absorption of gases from the distal air passages. Recent experimental work tends to indicate that partial atelectasis of one lobe never occurs. If one of

the smaller bronchi becomes occluded, there seems to be sufficient collateral aeration to prevent atelectasis.

### Prophylaxis

It is not the purpose of this paper to review the many measures that have been suggested to decrease the incidence of postoperative pulmonary complications. Most of these measures have been adapted with modifications to meet individual requirements. Not infrequently, however, perfectly obvious suggestions are disregarded. Too great emphasis cannot be laid on the need for adherence to detail, for any one of many factors may be responsible for the development of pulmonary complications.

The use of the Trendelenburg position following operation has been suggested, in order that there may be less likelihood of aspirating any material that is vomited or of aspirating the normal secretions of the oral cavity that accumulate in the posterior portion of the pharynx. This is particularly important during the first twenty-four hours after operation, when the patient remains abnormally quiet, owing to the effects of narcotics, and when the cough reflex has not become fully reestablished.

The development of certain pulmonary lesions and of thrombophlebitis in the lower extremities are closely related. Undoubtedly retardation in the rate of blood flow in the extremity is an important etiologic factor in formation of thrombi. The accepted treatment has been elevation of the extremity and application of external heat. It did not seem unreasonable, therefore, to elevate the extremities as a prophylactic measure in order that the return venous flow might be encouraged during the twenty-four hours immediately after the operation, when activity is at a minimum.

For these two reasons, and because lowering of the head is often indicated following serious abdominal operations, in order to increase the circulation to the higher centers, a series of 276 patients were consecutively placed in the Trendelenburg position for the first twenty-four hours after abdominal operations. In many instances, multiple operations were performed, but only the chief lesion for which surgery was indicated has been included. The position was obtained by raising the foot of the bed approxi-



# POSTOPERATIVE PULMONARY COMPLICATIONS—GRAY

COMPARISON OF INCIDENCE OF PULMONARY COMPLICATIONS IN RELATION TO WHETHER OR NOT PATIENT WAS PLACED IN TRENDLENBURG POSITION AFTER OPERATION ON VARIOUS STRUCTURES OR FOR VARIOUS CONDITIONS

Structure or condition	Patients not placed in Trendelenburg position			Patients placed in Trendelenburg position		
	Patients	Pulmonary complications		Patients	Pulmonary complications	
		Cases	Per cent		Cases	Per cent
Biliary tract	737	54	7.3	57	1	1.7
Stomach and duodenum	451	44	9.8	65	5	7.6
Uterus, tubes, ovaries	674	20	2.9	37	2	5.4
Hernia	256	14	5.4	29	1	3.4
Large bowel	485	38	7.8	5	0	.0
Small bowel	59	8	13.5	2	0	.0
Appendix	491	20	4.0	61	3	4.9
Miscellaneous				20	0	.0
Totals	3153	198	6.2	276	12	4.3

mately 10 inches (25 cm.). It is obvious that there are certain instances in which the position definitely would be contraindicated, such as in the drainage of any intra-abdominal, suppurating process or when the position produced respiratory embarrassment. The first twenty-four hours after operation was chosen as an arbitrary time limit, chiefly because patients are inactive during this period, and the cough reflex rarely becomes entirely reestablished sooner. The incidence of postoperative pulmonary complications in the group in which the Trendelenburg position was employed was compared with the incidence of such complications in a much larger group (3153 patients), in which the Trendelenburg position was not employed. The two groups were as nearly alike as possible relative to the type of operation, seriousness of the lesion, age of the patients, type of anesthesia, time of year, and other factors that might influence results.

No attempt was made to subdivide surgical procedures in certain regions into innumerable

types of operation, nor was an effort made to correlate the type of pulmonary complications with regions or with operations. It was felt that an attempt to tabulate these data would serve only to confuse the issue. The various pulmonary complications, which were of such severity as to prolong the patient's convalescence beyond the normal limit, were grouped together in order that the investigation might be simplified. The most common pulmonary complications were bronchitis, bronchopneumonia, partial or total atelectasis, infarct, and pleurisy with or without effusion. Occasionally, lobar pneumonia was observed and, rarely, suppuration in the pleural space. Aggravation of previous pulmonary lesions by conditions such as bronchitis and bronchiectasis, has been noted and these cases have been included in the present study. In table 1 may be seen the comparative results.

## Comment

The apparent reduction in the morbidity rate of pulmonary complications by the postoperative use of the Trendelenburg position may be due to the fact that a relatively small group of patients has been studied. However, a reduction of 30 per cent in the incidence of postoperative pulmonary complications is sufficiently large to warrant thorough trial. There is no discomfort in the position if elevation of the foot of the bed is moderate and, with rare exceptions, there are no contraindications. Of the thirteen patients who suffered from pulmonary complications, in spite of having been placed in the Trendelenburg position, six died (46.1 per cent). Possibly then, the incidence of postoperative pulmonary complications can be reduced by 30 per cent through the simple expedient of the use of the Trendelenburg position, and if so, possibly an appreciable reduction in the general operative mortality rate in abdominal cases will be achieved.

## Summary

A brief résumé of the most important etiologic factors in the production of postoperative pulmonary complications has been given. A series of 276 patients who had undergone abdominal operations and were consecutively placed in the Trendelenburg position for the first twenty-four hours after the operation were compared with a similar but larger group of 3,153 patients not

so treated; the incidence of postoperative pulmonary complications was 30 per cent less in the group in which the Trendelenburg position was employed.

A plea is made for meticulous attention to detail in the preoperative, operative, and postoperative period, in order that the incidence of postoperative pulmonary complications may be reduced.

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## A STUDY OF TUBERCULOSIS IN FAMILIES\*

G. A. HEDBERG, M.D.

*Nopeming, Minnesota*

**N**OPEMING Sanatorium has conducted outpatient work since its inception in 1912. Since 1918 tuberculosis clinics have been conducted at strategic points throughout the county. These clinics have provided contact with suspected cases of tuberculosis as well as follow-up of ex-sanatorium patients and members of their families. Since the popular use of x-rays in tuberculosis work, films have been taken at Nopeming and Duluth Hospitals of suspected cases of tuberculosis and of contacts. This year arrangements have been made to take x-rays at the various hospitals on the Range. Nopeming Sanatorium maintains a central registry of the x-ray readings, clinical records, et cetera, of all of this work. In addition to this work attempt is made to check all family members and close contacts visiting patients at Nopeming with Mantoux tests and x-ray films.

In our current files of contact follow-up records of patients now in the sanatorium and of recently found positive sputum cases we have ninety-four families with more than one member having demonstrable tuberculosis of the adult type. Of this number sixty-eight have two cases, twenty-one have three cases, and five have more than three cases in the family. It is significant that in this group the presence of positive sputum cases over a long period of time is much more frequent in families with three cases than in those with two. In the five families having more than three cases of tuberculosis, three have had a member die in the home of this disease

after prolonged illness under care of members of the family. The fourth family had a father with chronic non-disabling tuberculosis which was found after one son had been admitted to the sanatorium with far advanced tuberculosis. Positive sputum could not be demonstrated but the history revealed a chronic cough and expectation of long standing several years previous. It is reasonable to presume that positive sputum was present at that time. In the fifth family a similar condition existed. The father refused examination of any sort but has had a chronic productive cough as long as members of the family can remember.

Investigation of the economic and social conditions of the families are too incomplete to warrant conclusions. From the meagre information available and from the reports of the patients themselves, one gains the impression that the average conditions at home were below the normal level in the families having more than one case of tuberculosis, but that there was no significant difference in the status of the families having two, three, or more cases, except as a result of the decreased earning power as the additional cases developed. Overcrowding in the home and improper hygiene was quite common in this series but this is not unusual in a great many of the rural communities in the county.

The factors of individual and racial resistance to tuberculosis must be considered. Of course one would assume that inherent resistance of the individuals in each family would likely be similar to some extent. In many of the families one is struck by the similarity of types of lesions in

\*Read before the Trudeau Society at the annual meeting of the Minnesota State Medical Association, Duluth, July 16, 1934.

members of the same family. A large number of nationalities are represented by those who have immigrated to St. Louis county in the last generation to work in the woods, the mines, and at farming. In the group of families studied there is no marked preponderance of any nationality out of proportion to its number in the county population.

It would seem that the most important and significant factor in the occurrence of tuberculosis in several members of a family is the presence over a prolonged period of an "open" case. The dosage of tubercle bacilli seems to overshadow other factors in producing active disease after one has developed the primary infection. The interval between the added infection and the production of active disease may be several years.

Of the members of families of patients with positive sputum who have been tuberculin tested, over 80 per cent react positively when 1/10 milligram of old tuberculin has been injected intradermally. It is significant that the negative reactors are usually older children in the family who probably have had less contact with the patient. With one exception in this group, x-rays taken of negative reactors in contact families showed no evidence of tuberculosis. In the positive reactors examined by x-ray, parenchymal lesions of the primary type were most often found in the children, and, indeed, the younger the child in the family the more marked the involvement. When these lesions have been demonstrated the child has either been observed at the sanatorium or has been allowed to remain at home and checked by frequent Roentgenograms until the lesion has markedly resolved or calcified. When home conditions are good and the source of infection has been eliminated home observation is now being used at Nopeming unless the child is obviously ill. In the asymptomatic child with a parenchymal lesion, hospitalization is advised only when the primary lesion shows evidence of progression.

It is our feeling at Nopeming that the responsibility for the supervision of contact follow-up rests with the sanatorium. When possible it is most ideal to have this work done by the family physician. We find, however, that the majority of contact families in St. Louis county are unable to finance the complete examination

without some financial aid. The majority of the x-ray work, therefore, is done at the sanatorium or at the nearest x-ray laboratory able to do satisfactory work. An attempt is made to collect all or part of the fee charged for the x-ray by the laboratories and the sanatorium pays for the remainder. Experience has proven that this type of work, considered from the financial aspect alone, pays. Through this work numerous cases of minimal tuberculosis have been discovered in time to secure arrest at home without the necessity of sanatorium residence. A survey of Nopeming patients made last year showed that the average stay of patients admitted through the out-patient clinics and contact investigation was 70 per cent that of those patients admitted by their family physicians.

In conclusion, short histories of seven family groups are presented:

*Family No. 1.*—Alfred S. (key case), hospital orderly since 1929, in April, 1933, developed a cough and began losing weight. On July 20, 1933, he consulted a physician who found positive sputum present. X-ray showed far advanced tuberculosis. Illness ran a very active course and patient developed meningitis and died at Nopeming, December 14, 1933. He had been living at his sister's home for one year previous to his admission to Nopeming.

Henning W., brother-in-law, is in good health. He was checked as contact: Mantoux positive; x-ray negative.

Jenny W., sister, is in good health. Checked as contact: Mantoux positive; x-ray negative.

Marvin W., nephew, became ill in August, 1933, and died of tuberculous meningitis October 7, 1933.

Gordon W., nephew, has been under out-patient observation since August, 1933. X-ray showed a tuberculous lesion in right lung which was considered primary. In April, 1934, there was an extension of the disease and it was felt best to hospitalize him. Now at Nopeming.

*Family No. 2.*—Samuel J. is not ill. His first two wives died, cause unknown. The third wife died of tuberculosis. X-ray negative. Mantoux positive.

Turna J., daughter (key case), died at home of tuberculosis in January, 1925. She was cared for by her mother, Mrs. Mary E. J.

Mrs. Mary E. J., wife, was admitted to Nopeming, February, 1925, as a suspect. Negative sputum. X-ray showed a Ghon tubercle, but no evidence of active tuberculosis. Discharged in March, 1925. Readmitted in August, 1925, following premature delivery of twins. Discharged again in September. Readmitted August 31, 1928, with a diagnosis of milary tuberculosis. Sputum positive. Died eleven days later.

Hilda J., daughter, was admitted to Nopeming, Feb-

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ruary, 1925, for observation as a suspect. Positive Von Pirquet reaction. No definite tuberculosis in x-ray. Discharged in March, 1925. Well until April, 1928. Readmitted to Nopeming August, 1928, as MAA. Sputum positive. Still a patient. Poor prognosis.

John E. J., son, was admitted to Nopeming, July, 1925, FAB. Positive sputum. Never did well. Remained until June, 1928, when he developed tuberculous meningitis and died.

Mrs. John M., step-daughter, was admitted to Nopeming, August, 1932, FAA. Positive sputum. Developed tuberculous meningitis and died September 20, 1932.

(A) Matt M., husband. Positive Mantoux. Negative chest.

(B) Donald M., son. Positive Mantoux. Calcified Ghon tubercle. No evidence of activity.

William J., son, was admitted to Nopeming in July, 1928. Positive Mantoux. MAA. He has required continuous sanatorium care to date. X-ray shows fibrosis (MAA). Guinea pig (sputum) positive.

Edwin J., son, was admitted to Nopeming, July, 1928. Positive Mantoux. X-ray showed childhood tuberculosis. Discharged for home care, June, 1932.

Ruth J., daughter, was admitted to Nopeming, September, 1928. Positive Mantoux. X-ray showed childhood tuberculosis. Has done only fairly well. Discharged April, 1934.

Wilma J., daughter, was admitted to Nopeming September, 1928. Positive Mantoux. X-ray showed childhood tuberculosis. Did well. Discharged August, 1929.

Siami J., daughter, is not ill. Positive Mantoux. Negative x-ray.

Jenny J., daughter, is at home. Her health is fair. There is no record of a check-up.

*Family No. 3.*—Mrs. Johanna Z. (key case), died of tuberculosis in January, 1929. Repeated positive sputum reports. Remained at home through illness.

Anton Z., husband, is not ill. X-ray showed pneumoconiosis with calcified Ghon tubercle.

Jennie Z., daughter, became ill in July, 1931. Positive sputum, September, 1931. She remained home until November, 1931 and is still a patient with positive sputum. She is doing poorly and has phrenic, with pneumo on contralateral side.

Mrs. Barbara J., neighbor, took water supply from Z's in winter time. She became ill in July, 1931. Positive sputum in September, 1931. Remained home until September, 1932. Pneumothorax case. Prognosis fair. Has two children:

(A) Betty, aged six. Negative chest. Positive Mantoux. Not yet x-rayed.

(B) Donald, aged four. Negative chest. Positive Mantoux. Not yet x-rayed.

(C) Husband not yet checked. Health reported good.

Tony Z., son, is not ill. Negative chest repeatedly. Positive Mantoux. Has not been x-rayed.

Ann Z., daughter, is not ill. Negative chest. Positive Mantoux. X-ray shows Ghon tubercle not completely calcified. At home.

Angela Z., daughter, is not ill. Occasional physical findings. Positive Mantoux. X-ray shows childhood tuberculosis with Ghon tubercle. Under observation at home.

Mary Z., daughter, is at Nopeming. MAA with negative sputum. Positive Mantoux. Good prognosis.

Joseph Z., son, was at Nopeming for observation from February 27, 1933, to September 10, 1933. Negative chest. Positive Mantoux. X-ray shows childhood tuberculosis. Prognosis good.

Frank Z., son, was at Nopeming for observation from February to September, 1933. Negative chest. Positive Mantoux. X-ray shows childhood tuberculosis. Prognosis good.

Margaret Z., daughter, was at Nopeming for observation from February to September, 1933. Negative chest. Positive Mantoux. X-ray shows childhood tuberculosis.

*Family No. 4.*—Mrs. Mary M. (key case), was diagnosed as having pulmonary tuberculosis in October, 1929. There was positive sputum at this time and consistently thereafter. She was admitted to the hospital in October, 1929, and left three weeks later, refusing to return or go to a sanatorium. She lived at home with her family until death in September, 1931.

Mike M., husband. Positive Mantoux. X-ray negative.

Nick M., son, aged nineteen years. Positive Mantoux. Negative chest examination and x-ray.

Peter M., son, aged eighteen years. Positive Mantoux. Negative chest examination and x-ray.

Mildred M., daughter, aged fifteen years. Positive Mantoux. Negative chest examination and x-ray in 1931. X-ray, February, 1934, showed FAA. Admitted to Nopeming, April, 1934. Pneumothorax.

Mollie M., daughter, aged fourteen years. Positive Mantoux. Negative chest. X-ray showed calcified glands in left hilus. She was observed at Nopeming from October, 1931, to June, 1932, and is now under home observation.

Dorothy M., daughter, aged twelve years. Positive Mantoux. Negative chest. X-ray showed calcified glands and Ghon tubercle. She was observed at Nopeming from September, 1931, to December, 1931 and is now under home observation.

Helen M., daughter, aged ten years. Positive Mantoux. Negative chest examination. X-ray showed enlarged hilus glands and infiltration into left upper lobe. She was observed at Nopeming from October, 1931, to December, 1931.

Annie M., daughter, aged eight years. Positive Mantoux. Negative chest examination. X-ray shows enlarged hilus glands and infiltration into left upper lobe. She was observed at Nopeming from October, 1931, to June, 1932, and is now at home.

Bessie M., daughter, aged seven years. Positive Mantoux. Negative chest examination. X-ray shows recent childhood tuberculosis, right lung. She was admitted to Nopeming, October, 1931, and is still a patient.



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Steve M., son, aged four years. Positive Mantoux. Negative chest examination. X-ray showed childhood tuberculosis of left lung. He developed tuberculosis of elbow and spine. Draining pus from sinuses. Positive for tuberculosis.

*Family No. 5.*—Mrs. Anna S. (key case) was first admitted to Nopeming June 25, 1924. Positive tuberculin. Negative sputum. Minimal A (non-clinical). No expectoration. She was discharged as an inactive case August 15, 1924. She occasionally attended clinics and did well. She has a fourth child.

In May, 1932, she began to cough and lose weight. Sputum at that time was negative. First positive sputum report was in July, 1932. She was admitted to Nopeming August 23, 1932. MAB in August, 1933.

Matt S., husband. Positive Mantoux. X-ray negative.

Edward S., son, went to live on a farm in June, 1932, for the summer. Examination in September, 1932, showed negative chest and negative Mantoux. Mantoux negative again in January, 1933. X-ray repeatedly negative and Mantoux with 1. mg tuberculin negative July, 1933.

Ruby S., daughter, lived with mother until her admission to Nopeming. Examined at clinic in July, 1932. Mantoux positive. X-ray July 30, 1932, showed a childhood lesion. Admitted to Nopeming August, 1932, for observation. Discharged December, 1932. Doing well.

Ardell S., daughter, had contact with mother through breakdown. Examination September, 1932. Mantoux positive. X-ray showed childhood tuberculosis. Observed at home.

Robert S., son, had contact with mother through breakdown. Examined in September, 1932. Mantoux positive. X-ray showed extensive primary lesion. Admitted to Nopeming September 25, 1932. Developed adenitis in spring of 1933, which regressed under ultraviolet ray. Discharged in June, 1934.

*Family No. 6.*—Anton B., father, is in good health. He has been an underground miner for seventeen years. X-ray shows evidence of pneumoconiosis but no tuberculosis.

Angela B., mother, is in good health. X-ray shows a normal chest.

Angeline B. (key case), worked in same room with a positive sputum patient and became ill Christmas, 1931. Tuberculosis diagnosed February, 1932. Pneumothorax was started by her physician in February, 1932, and patient returned home March, 1932. Sputum

reported positive twice in October, 1932. Admitted to Nopeming in June, 1933, as FAB bilateral, with positive sputum. Still a patient.

Julia B., sister, was examined February, 1932. Mantoux and x-ray negative. Mantoux again negative, July, 1932. Mantoux positive, March, 1933. X-rays repeatedly negative to date.

Rose B., sister, was examined as contact in February, 1932. Mantoux and x-ray negative. Mantoux again negative July, 1932. Re-examined in March, 1933. Mantoux positive. X-ray showed a minimal parenchymal lesion in left lung. This lesion has been closely checked by x-ray and is resolving.

*Family No. 7.*—Florence E. (key case), developed a cough in spring of 1929. She was admitted to Nopeming as FAC in September, 1929. Sputum positive. Phrenic in September, 1930, with marked improvement and negative sputum. Left against advice in April, 1932, and "took the cure" at home. One positive sputum report in January, 1933. In January, 1934, she was re-admitted following an abortion. FAC with positive sputum. She now has bilateral cavitation and is a terminal case.

Fritz E., husband, was first examined as contact in January, 1930. X-ray at that time was negative. In July, 1930, he complained of dyspnea and loss of weight of one month's duration. X-ray showed a pleural effusion on right side. He recovered from complaints and continued to work; gained 12 pounds. Mantoux in 1930 was negative. He did not report for re-examination until after wife's re-admission. On February 7, 1934, he was re-examined and at that time stated that he had felt fine and worked every day as a shipping clerk until December, 1933, when he noticed slight fatigue which he attributed to the added burden of his wife's illness. In January, 1934, he developed a "cold" with slight cough and expectoration; no weight loss. X-ray showed a moderately advanced bilateral lesion of an exudative type. He refused hospitalization. Mantoux was negative. X-ray March 1, 1934, showed a marked advance. Sputum was positive March 1, 1934. He was admitted to Nopeming March 11, 1934. Under strict bed rest lesion is beginning to show regression and last two sputum tests were negative. Mantoux is still negative.

Doris E., daughter, was examined as contact. Mantoux positive and x-ray shows calcified hilus glands.

Marion E., daughter. Mantoux positive and x-ray shows calcified hilus glands and Ghon tubercle.

Robert E., son. Mantoux positive and x-ray shows calcified hilus glands.

## FACTORS CONTRIBUTING TO THE FURTHER REDUCTION OF TUBERCULOUS INFECTION\*

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THAT tuberculosis is a transmissible disease was first definitely proven in 1865 by Villemin.<sup>1</sup> But nearly one hundred years before, laws based on the assumption that the disease was infectious were enacted in the Kingdom of Naples,<sup>2</sup> and those laws were largely instrumental in the 80 per cent reduction of mortality from tuberculosis which took place there up to 1887 and which left that section with a death rate of 195 per 100,000.

Since that time, gradually evolved protective measures and the widespread dissemination of educational information concerning the disease have contributed toward the steadily declining death rate throughout the world. With this decrease in mortality has come a decrease in the infection of individuals with the tubercle bacillus, and we are led to believe from the work done among University students by Myers<sup>3</sup> at Minnesota, who finds 33 per cent of freshmen tuberculin positive, and Soper and Wilson<sup>4</sup> at Yale, who find 59 per cent, that the infection among adults in this country is no longer as high as was formerly thought.

The question which now presents itself is: Can we further reduce the infection of tuberculosis or have we reached the irreducible minimum? With the mortality curve still going down, it is not too much to expect that infection itself can be made to follow.

This paper deals with the advice that should be given tuberculous patients and those who care for them. It discusses those hygienic rules that are not generally in force and refinements of some of the well established rules. It does not touch upon those measures less frequently overlooked which provide for the sterilization of bed linen, dishes, towels, and the like.

In pulmonary tuberculosis, which is the most prevalent form of tuberculosis in this country, it is the sputum which contains the greatest num-

ber of bacilli. It is therefore imperative that expectoration be disposed of so effectively that there will be no gross contamination. Since Baldwin<sup>1</sup> brought out the fact in 1898 that patients' hands were more likely to be contaminated if they used handkerchiefs for expectoration than if they used cuspidors, it has been the practice in most institutions to use waterproof paper cups for that purpose. In some institutions, however, patients are still allowed to expectorate into paper napkins.

Tests<sup>†</sup> have shown that expectoration, the consistency of saliva, will penetrate one thickness of paper napkins in one second or less, two thicknesses in two seconds, and three thicknesses in four seconds.

The rapid transmission of moisture through paper napkins permits the more rapid transmission of tubercle bacilli and other organisms, which makes this method of sputum disposal obviously unsatisfactory. This is true not only for the bed patient but for the ambulant patient and I cannot agree with those who advise the use of rubber lined pockets in which ambulant patients may place soiled paper napkins.

The paraffin coated cardboard pocket sputum cup for ambulant patients and the square covered paraffin coated boxes for bed patients appear then as the best means for sputum disposal.

Another factor that contributes much to the exposure of the healthy person is the expelling of tubercle bacilli during the act of coughing. Although this, too, is a controllable factor, physicians have permitted the patient to handle it in haphazard fashion. Not infrequently one sees the patient hold his napkin at an angle that prevents complete covering of the mouth and nose. Another attempt noticed particularly among women is to cough into a crumpled napkin, which allows the fingers to become contaminated. Then

\*From the Glen Lake Sanatorium, Oak Terrace, and the Department of Medicine, University of Minnesota. Read before the Trudeau Society at the annual meeting of the Minnesota State Medical Association, Duluth, July 16, 1934.

†May be demonstrated either by: (1) one napkin treated with 5 per cent alcoholic sodium hydroxide; another treated with 1 per cent phenolphthalein; (2) one napkin treated with 5 per cent alcoholic ferric chloride and later dusted with potassium ferricyanide.

again, the napkin may be held in such a manner that the thumb is interposed between the napkin and the lips.

In my opinion, the most satisfactory method is



Fig. 1. Correct way to hold napkin.

to hold the napkins so that the fingers will not be contaminated either during the act of coughing or when the napkin is being disposed of (Figure 1). If the napkin is held in this manner, the droplets ejected with the cough are for the most part absorbed and the air from the cough escapes around the edges of the napkin. This requires a napkin of satisfactory weight and at least 6x6 inches in size.

Gauze napkins were formerly used in most sanatoria, and a patient was given one folded piece of gauze in the morning which he was to use throughout the next twenty-four hours. This, of course, soon became contaminated and everything with which it came in contact became contaminated in addition to the pockets and hands. Of late, gauze has been largely replaced by plain or crepe paper napkins. While this has been a step forward, the napkins available at present leave much to be desired.

I have shown<sup>5</sup> that one thickness of the average crepe paper napkin allows the transmission of organisms rather freely, that two thick-

nesses reduce this transmission by 85 to 90 per cent, and that three thicknesses practically stop the passage of organisms. In comparing gauze with paper napkins, I have found that one thick-

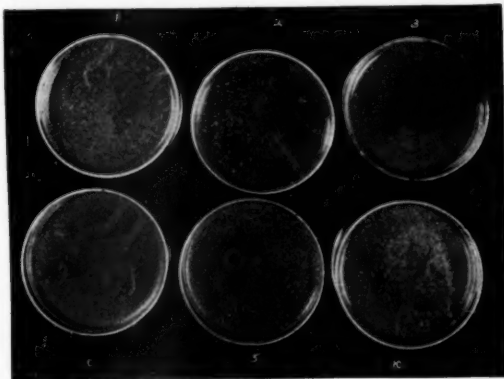


Fig. 2. One, two and three thicknesses of paper napkins compared with five and ten thicknesses of gauze. C—control.

ness of paper napkin was almost as effective in filtering out organisms as ten thicknesses of gauze of 12x20 mesh (Fig. 2).

Advising patients to prevent contamination of their hands by using their napkins correctly is of no avail if they are not taught that wetting their fingers before reaching for the napkin will likewise contaminate them. There has recently been placed upon the market a napkin dispenser which permits the patient to procure a napkin with great ease and it is hoped that this will eliminate the wetting of fingers. It is also hoped that medical opinion will force the manufacturers to provide these dispensers with napkins of a texture so firm that one napkin will give as much protection as three do now in checking the transmission of organisms.

To insist that patients hold paper sputum napkins over their mouths and noses while coughing and sneezing is important, but its practical value is nullified if the patient is allowed to lay the used napkin, face down, on his clothing or bed covers. As this is a common practice, I think that its correction should be stressed. Disposal of paper napkins is provided for in the sanatorium by hanging paper bags on the side of the patient's bed, but no provision is made for the disposition of napkins while patients are on their walks. As patients are, for the most part, not ingenious enough to devise means of their own,

they should each be provided with manilla envelope or bag for use away from the bedside.

As we have no proof that smoking in moderation is detrimental to the patient with pulmonary tuberculosis, I think we must accept the fact that many individuals who enjoyed smoking before they contracted the disease will continue to smoke during their illness. It is also true that a greater number of people are smoking now than ever before. The possibilities of cigar and cigarette stubs becoming contaminated by tubercle bacilli are great and patients should be taught that the stubs should not be thrown upon the floor nor upon the ground, but should be disposed of in such a manner that they will not be a source of contamination. Pipe stems are as readily contaminated and should be as carefully handled as any other contaminated article.

Artificial teeth and tooth brushes afford other means of transmitting tubercle bacilli. Washings taken from the artificial teeth of eight patients who had positive sputum were injected into guinea pigs and six pigs developed tuberculosis. Likewise, washings were taken from the tooth brushes of another group of eight patients who had positive sputum and were injected into guinea pigs. Three pigs of this group were found to be tuberculous.

It was a revelation to see how and where artificial teeth and tooth brushes were kept by patients with tuberculosis. Teeth in some instances were found on top of the bedside table or loose in the table drawer. One man encountered had difficulty in untangling his watch chain from the wire attachment on his artificial teeth which were thrown carelessly into his drawer. Tooth brushes were found in cardboard containers in which they were originally bought, in cigar boxes with shaving articles, and even rolled into wash cloths, but for the most part they were kept in celluloid boxes. It can be seen that some sort of sanitary provision should be made for the care of tooth brushes for every tuberculous patient and this should not be left to the ingenuity of the individual patient. Special instructions as to the handling of artificial teeth should be given to guard against contaminating the fingers.

Most individuals unthinkingly put various objects in their mouths. Many are in the habit of wetting their fingers before turning the leaves of a book. Others take gum out of their mouths

with their fingers. Since these little unconscious acts are numberless, it is not surprising to find such habits firmly set in the individual who develops tuberculosis. For this reason, emphasis should be laid on the correction of these habits to further reduce tuberculous infection. Needless to say, these habits can be corrected by repeatedly calling the patient's attention to them but will never be corrected if they are ignored by those aware of their potential danger.

Perhaps there are those who argue that if too much attention is drawn to the dangers lurking in these simple habits, patients and relatives alike will become too apprehensive and will develop a phthisiophobia. This thought was advanced when Geer<sup>3</sup> introduced his aseptic technique. His experience, however, after a two year trial, has been that relatives, patients, and employees alike welcome the precautions taken.

Library books and paper money offer other vehicles for tubercle bacilli. Mitulesen,<sup>6</sup> in studying the problem of books, cut up thirty-seven books that had been used in the Berlin Public Library for from three to six years and injected the washings made of these clippings into guinea pigs. Twenty-six per cent of the pigs developed tuberculosis and a similar percentage died of septicemia. If it is possible to infect guinea pigs with tubercle bacilli in this manner from books that have been used in a public library, it should be equally possible from books in a sanatorium library. The manner of transmission of infection by fomites such as books has been a problem discussed by public health officials and heads of hospitals for years. Formerly, the danger from this source was considered great. Later experience has proven that it is slight. It has not been shown that library workers are more susceptible to clinical tuberculosis and similar infections than the general population. If the possibilities of infection from books are explained to patients and workers so that they may take the precaution to wash their hands after reading, the likelihood of infection from this source is nil.

### Conclusions

The suggestions made here, while designed primarily for the tuberculous patient and the tuberculosis sanatorium, are also applicable to the general hospital as it has been shown by Hill<sup>4</sup>



that from 34 to 40 per cent of the cases admitted to general hospitals may be considered infectious in one way or another.

Few patients admitted to sanatoria have any practical knowledge of aseptic procedures. It is therefore necessary that they be given more explicit instructions for the prevention of infection than is at present generally given in sanatoria. I believe that by so doing a further reduction of tuberculous infection can be brought about.

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## MANAGEMENT OF KIDNEY INJURIES\*

### With Special Reference to the Value of Intravenous Pyelography

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I WILL make no attempt at a comprehensive thesis on kidney injuries or their management. There are many sources of information regarding the etiology, pathology, symptomatology, diagnosis and treatment of these injuries. I wish to emphasize only two points: (1) the value of intravenous urography in the diagnosis of kidney injuries; and (2) the value of conservatism, within limits, in their treatment.

Previous to December, 1932, we had regularly used only plain x-ray films of the abdominal region as an aid in the diagnosis of injuries in the region of the kidney. In five cases in this series the plain film was of some value in showing the mass in one renal region obliterating all or part of the corresponding psoas shadow and causing scoliosis toward the opposite side. Bowel distention in some cases made the interpretation of the films difficult. Since the end of 1932, with the advent of safe and efficient solutions in small amounts for intravenous urography, we have used intravenous urography almost routinely as an aid in diagnosis of kidney injury. I wish to show the films from four such cases. The evi-



Fig. 1. Partial obscuring of right psoas shadow and a suggestion of scoliosis toward opposite side.

Boy, nine years old, fell fifteen feet. Hematuria. Marked abdominal rigidity and tenderness especially on right side. Pulse rose to 158 on second day. Operation disclosed large hemoperitoneum from peritoneal lacerations over cecum and liver, and complete severing of lower third of right kidney with large hematoma around it. Nephrectomy and repair of peritoneum. Recovery. Home in twenty-three days. (Dr. L. O. Doyle.)

\*From the Department of Urology, Minneapolis General Hospital, and St. Mary's Hospital, Minneapolis. Read before the annual meeting of the Minnesota State Medical Association, Duluth, July 16, 1934.

KIDNEY INJURIES—SWEETSER



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.

# KIDNEY INJURIES—SWEETSER

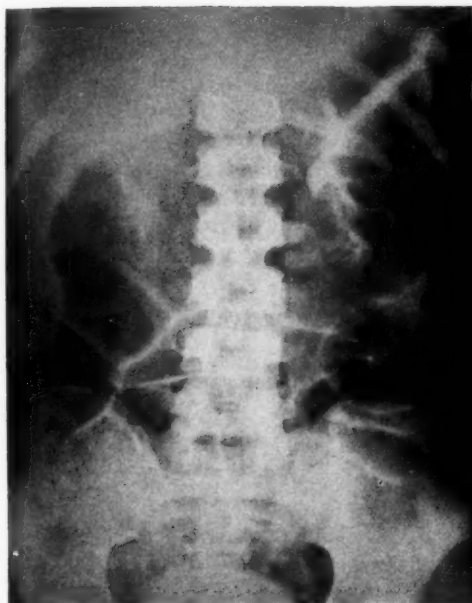


Fig. 6.



Fig. 7.

Fig. 2. (left) Obscuring of left psoas shadow and scoliosis toward opposite side. Film exposed nineteen days after accident.

Student nurse hurt in automobile accident. Hematuria. Pain and rigidity of left side of abdomen and back. Mass was demonstrated in left flank several days after the accident. No operation. Recovery. Home in twenty-two days.

Fig. 3. (right) Marked gaseous distention of bowels. In spite of that, there is demonstrable obscuring of right psoas shadow and evidence of soft tissue mass in right kidney region.

Boy, eight years old, fell into open area-way striking right flank on edge. Hematuria. Vomiting. Mild distention. Marked abdominal tenderness especially on right side without rigidity. Shock with pulse 130 and blood pressure 95/65. Improved for three days; then developed hematuria again, and larger mass in right flank with fever. Operation disclosed right perirenal hematoma and almost complete severing of one-third of kidney. Nephrectomy. Recovery. Home fifty-six days after accident.

Fig. 4. (left) Intravenous pyelography shows very incomplete irregular filling of left renal pelvis. Film also shows obscuring of left psoas shadow and slight scoliosis towards opposite side.

Boy, ten years old, collided with a post while sliding. Hematuria. Pain and tenderness and some swelling in left flank. Rigidity of lower abdomen. Some shock. Hematuria disappeared but began again in eight days and condition necessitated transfusions and operation, which disclosed left perirenal hematoma and almost complete rupture of kidney. Nephrectomy. Recovery. Home thirty-five days after accident.

Fig. 5. (right) Intravenous pyelography shows almost no dye in right pelvis; the left renal pelvis is incompletely filled and there is possibly some dye out in the renal parenchyma at upper pole and at center. There is a very marked gaseous distention of the gastro-intestinal tract.

Boy, eleven years old, collided with a tree while sliding. Hematuria. Dyspnea. Vomiting. Severe pain in left flank. Rigidity of upper abdomen, principally on right side. No operation. Recovery. Home in seven days.

Fig. 6. (left) Intravenous pyelogram shows very incomplete irregular filling of right renal pelvis. Film also shows obscuring of right psoas shadow and scoliosis toward opposite side. Marked gaseous distention of the bowels is also evident.

Boy, ten years old, fell twenty feet from a tree, landing on back and right side. Hematuria. Vomited twice. Abdominal pain. Tenderness and rigidity in right flank with pain on right lumbar percussion. No operation. Recovery. Home in twenty days.

Fig. 7. (right) Same case as Figure 6. Film exposed on nineteenth day after accident. Intravenous pyelogram shows much improved filling of right renal pelvis. The psoas shadow is now well defined and the scoliosis has disappeared. There is but little gas in the colon.

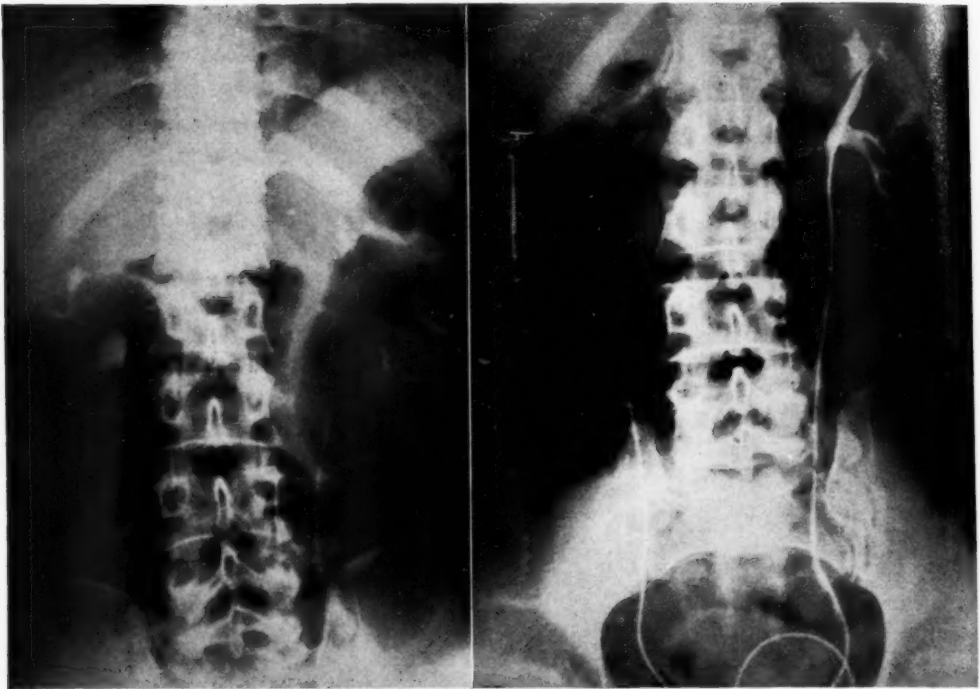


Fig. 8. (left) Intravenous pyelography shows incomplete filling of most of left renal pelvis. Film also shows scoliosis towards opposite side. Both psoas shadows are obscured, probably because of the marked gaseous distention of the bowels.

Man, forty-two years old, fell three feet to concrete floor. Hematuria. Pain in left lumbar region and abdomen. Tenderness, rigidity and reflex spasm of left upper abdominal quadrant. Left lumbar percussion pain. Dyspnea with pain on breathing and tenderness over left ribs (fractured). No operation. Recovery. Home in ten days.

Fig. 9. (right) Same case as Figure 8. Film exposed on seventh day after accident. Retrograde pyelography shows distinctly an irregular rupture of the parenchyma of midportion of left kidney.

dence consisted of very incomplete and irregular filling of the renal pelvis of the affected kidney, or collections of the dye beyond the calices in the renal parenchyma. In none of our cases was extravasation outside the kidney shown but such might be demonstrated in case of a torn pelvis or ureter. Antecedent disease of the kidney might also be shown and this would serve as a guide to treatment.

The other point which I wish to emphasize is the principle that, in general, conservative treatment of kidney injuries is safest. Each case is an individual problem in judgment, and every such patient requires continuous and close observation; but I feel that, as long as there is any doubt as to the need for operation, it is safer to wait.

Of the twelve patients in this series, five with definite kidney injuries were treated conservatively by complete rest and close observation;

all recovered and kept both kidneys. The pyelograms demonstrated definite rupture of the kidney tissue in at least some of them. Five patients had operations within about twenty-four hours after the injury. Two of these had gunshot wounds demanding immediate operation because of associated wounds of other organs; the other three (two with associated injury of other organs) were watched for a few hours until operation became imperative because of rising pulse and other signs of hemorrhage or collapse. Of these five patients who had early operations two died and two had prolonged stormy convalescence. Two of the twelve patients had delayed nephrectomies at which we found almost complete rupture of the kidney with large perirenal hematomas in both cases. In each case operation was forced by recurrence of the hemorrhage, with additional signs of infection in one case. Both recovered.



## LATE TOXEMIAS OF PREGNANCY—LANG

In deciding to open the kidney space soon after an injury one must recognize the real danger of a serious and perhaps fatal reactivation of hemorrhage after it had been fairly controlled by pressure of surrounding tissues.

*Conclusion.*—Patients with signs of kidney injury are best treated by absolute rest (sandbags, morphine, etc.) and close, continuous ob-

servation, unless or until operation becomes undeniably necessary because of associated intraperitoneal injury or because of persistent or massive hemorrhage, urinary extravasation or infection in the hematoma. Intravenous pyelography is a fairly safe and usually very valuable aid in the diagnosis of kidney injury and should have greater recognition than it has had thus far.

## LATE TOXEMIAS OF PREGNANCY\*

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AS long as the etiology of the pregnancy toxemias remains unknown, any discussion of them will be involved with a considerable amount of uncertainty and obscurity, resulting from the great variety of individual opinion regarding these diseases.

Medical literature, past and recent, is replete with valuable clinical observations and innumerable laborious experimentations, representing in many instances the work of a lifetime, and yet we are at a loss to know why a certain number of pregnancies will eventuate in a "toxic" condition, jeopardizing the lives of mothers and their babies. We do know, however, that even a so-called normal pregnancy is attended with definite metabolic changes and that there is a very narrow borderline between health and disease in pregnancy, with a considerable strain on all of the vital organs. Most authorities attribute these functional organic alterations to the action of some toxin produced in the fetal or maternal organism, or more recently, to some hypothetical imbalance of the endocrin system.

The many accurate metabolic and physicochemical studies that have been done in normal and pathological pregnancies and the careful observations of the pathology of the various toxemic conditions, although they cannot tell us the actual cause or causes of the disease entities, do give us some leads toward a classification of the toxemias.

A working classification of the late toxemias of pregnancy, which is in use in many clinics today, is as follows:

- I. Low Reserve Kidney.
- II. Nephritis Complicating Pregnancy.
- III. Preeclamptic Toxemia.
- IV. Eclampsia.

Although it is obvious that the above is in many respects incomplete and unscientific, yet it gives us an opportunity to group our patients clinically, with a view to answering important questions as to procedure and therapy, and as to the prognosis, both immediate and remote. We will speak later regarding the questionable place that the term "low reserve kidney" has in this classification. But perhaps our greatest difficulty will arise in attempting to differentiate the severe preeclamptic from the nephritic toxemias. In fact, at times, we will not be able to make the correct diagnosis until the patient has come to the end of the puerperium or to autopsy.

I. *Low Reserve Kidney.*—This term was first introduced by Stander and Peckham to denote the mildest type of late toxemia of pregnancy. The condition is probably identical with that previously described as "kidney of pregnancy," "recurrent pregnancy toxemia" (Kellogg), "albuminuria of pregnancy" and certain so-called "nephroses." Dr. J. C. Litzenberg regards this condition, for teaching purposes, as a very mild form of preeclamptic toxemia.

The "low reserve kidney," which comprises about 35% of all cases of late toxemia of pregnancy, is characterized as follows:

1. An elevated blood pressure, rarely exceeding 150 systolic and 90 diastolic.
2. Albuminuria (about 1 gram per liter), which disappears during the puerperium.
3. Mild subjective symptoms, such as head-

\*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 16, 1934.

ache, general malaise, etc., may or may not be present.

4. A mild edema, or an excessive gain in weight ("occult edema").

5. Normal blood chemistry and renal function tests.

6. Outstanding is the fact that the patient recovers rapidly after delivery and that her condition does not become aggravated in future pregnancies.

The treatment, which consists of rest in bed, a low protein diet, and restriction of salt in the presence of edema, is usually followed by prompt improvement. If, however, the patient's condition becomes worse, in spite of the above simple therapy, we may feel that we are dealing with a true preeclamptic toxemia or possibly a chronic nephritis.

In managing a supposed case of "low reserve kidney" the most important point to keep in mind is that inasmuch as even the severest form of late toxemia may begin with mild symptoms, every case with any toxic symptom should be closely observed and not classified as "low reserve kidney" until careful study and favorable response to treatment definitely place it in that group. In other words, every case, even with the mildest symptoms, should be considered a preeclamptic toxemia until definitely proven otherwise.

II. *Nephritic Toxemia*.—This is usually seen in women who have had chronic nephritis before conception, occurs in about 25% of all toxemias of pregnancy and is of very grave significance.

It is usually possible to differentiate it from preeclampsia.

1. There may be a history of previous nephritis, or of one or more stillborn premature infants (next to syphilis this type of toxemia is the most frequent cause of intrauterine death).

2. Decreased renal function may be demonstrated.

3. The quantity of urine is more likely to be normal or increased with a low specific gravity, while in preeclampsia it is likely to be decreased.

4. The eye-grounds show retinal hemorrhage and albuminuric retinitis in severe cases, while arteriolar spasm and edema is all that is usually seen in the preeclamptic.

5. We are likely to have nitrogenous retention demonstrated by an elevated non-protein

and blood urea nitrogen (especially in the severe cases) which usually shows up earlier.

6. The behavior of the various abnormal findings after treatment has been instituted is sometimes helpful.

7. In 10 per cent of the cases the diagnosis cannot be made until late in the puerperium, when nephritis is diagnosed if the blood pressure and urine do not return to normal.

The prognosis for the mother is grave, because pregnancy accentuates the preexisting nephritis and because the condition tends to recur in subsequent pregnancies.

Stander and Peckman, in 236 cases, found a maternal mortality of 42.5 per cent within five years after the diagnosis had been made. The fetal mortality is around 20 per cent, due largely to deficient nourishment, caused by placental infarction.

The treatment, in general, is identical with that outlined for preeclamptic toxemia, induction of labor being seriously considered if a definite diagnosis is made and the patient has not responded to treatment.

Chronic nephritics are poor risks for pregnancy and should be advised against it.

III. *Preeclamptic Toxemia*.—This frequent type of late toxemia occurs several times in every 100 cases of pregnancy. It is characterized in general by a high or rising blood pressure, albuminuria and edema, with undue weight gain. The mild or moderately severe cases are usually amenable to the treatment outlined for the "low reserve kidney" patient, plus the use of sedatives, cathartics (such as magnesium sulphate) and diuretics to control the edema.

Careful prenatal care, with frequent and routine examination of urine and blood pressure, as well as observations in weight gain, once a month during the first six months, every two weeks until the ninth month, and every week during the last month, will detect the earliest signs and symptoms of the disease, when simple therapy, as mentioned above, will often ward off a serious preeclampsia and permit the pregnancy to go on, uncomplicated, to term.

The term "*preeclampsia*" denotes the very severe toxemia which is the forerunner of eclampsia, and which if not treated properly, almost always terminates in eclampsia. Most frequently its onset is insidious with rising blood pressure, followed by albuminuria, edema of the face

and extremities, and a decrease in urinary output. Occasionally it has a very acute onset with intense headache, epigastric pain, or visual disturbances such as double vision or amaurosis. Often, when first seen, the patient appears very ill and may be torpid or somnolent, or may even show twitchings of the extremities. Such a patient will have a blood pressure of around 190 systolic and 110 diastolic. The urine, which will be markedly decreased in amount (200 to 300 c.c. in twenty-four hours), will show 2 to 20 grams of albumin per liter, casts, and red blood cells in the severe cases. Examination of the eye-grounds may demonstrate arteriolar changes with spastic narrowing of the lumen in the early cases, which may become fixed in the severe cases. Retinal edema and hemorrhages into the retina are not uncommon, and occasionally detachment of the retina is observed. Diffuse retinitis of the albuminuric type is very rare and is usually considered to be diagnostic of nephritic toxemia.

In the treatment of preeclampsia, it is essential that the patient be put to bed in the hospital, where she is given a quiet, darkened room. Visitors are excluded. It is our custom to place the patient on a strict milk diet of one or more quarts a day, depending on the edema. Fluids are not restricted except in the presence of edema.

Sedatives are given—barbitals, chloral or morphin—depending on the severity of the toxemia. The blood pressure is taken several times a day and is recorded by graph. The intake and output are carefully observed and recorded. The urine is examined daily and the amount of albumin is quantitatively determined by the Esbach method. Blood chemistry studies are made with special attention to non-protein-nitrogen, blood urea nitrogen, uric acid, blood chlorides, blood sugar and  $\text{CO}_2$  combining power. The ocular fundi are examined on admission and at intervals thereafter. The bowels are kept free by moderate doses of magnesium sulphate, or by castor oil, if at or near term. If edema is marked and especially if there are signs of cerebral irritation, magnesium sulphate is given intravenously, 20 c.c. of a 10 per cent solution every four hours for six doses, or glucose in solutions of 10 to 20 per cent. Very occasionally, where the blood pressure is exceedingly high, venesection of 750 to 1000 c.c. is resorted

to before considering the termination of pregnancy.

If symptoms do not abate under treatment, the outlook is serious and eclampsia may supervene. We feel that a continued daily output of 5 grams of albumin per liter, or a blood pressure around 200, justifies emptying the uterus. The sudden appearance of amaurosis or epigastric pain, drowsiness, muscular irritability, or ocular fundi changes, may be similar justification.

Labor is induced in these cases, usually by bougies or bag, depending largely upon the condition of the cervix. The second stage is shortened by forceps or version, depending upon the station of the head. Chloroform is never used, nitrous oxide gas being the usual anesthetic.

IV. *Eclampsia*.—This occurs about once in 500 labors (Williams) and makes up about 12 per cent of the toxemias of pregnancy. It is defined as "an acute toxemia in pregnant, parturient or puerperal women, accompanied by clonic or tonic convulsions, during which there is loss of consciousness, followed by coma, and frequently resulting in death." Eclampsia may occur without convulsions, the patient showing typical pathological findings at autopsy.

Eclampsia occurs during the last trimester of pregnancy, occurring more often as full term is approached. It is more frequent in primipara (70 to 80 per cent), in twin pregnancy and in hydramnios. There is some evidence that it varies with the seasons, with a greater frequency during the spring months. This is one of the arguments of those who adhere to the infectious theory of eclampsia.

In its clinical course eclampsia is identical with preeclamptic toxemia, developing progressively in a few days or weeks until convulsions occur. But occasionally it may make its appearance very suddenly, with no warning other than a severe headache or epigastric pain (fulminant eclampsia).

The convulsions are commonly preceded by premonitory signs, but rarely may occur without warning. Eclampsia, because of the convulsions, must be differentiated from epilepsy, hysteria, uremia and certain chemical poisonings, such as from strychnin, phosphorous and nitrobenzol. The convulsions which may vary in number from 1 to 100 or more, are followed by a profound coma lasting from a few minutes to several days. The patient is not conscious dur-

ing a convulsion and may not even remember the attack. When death occurs during an attack, it is usually due to edema of the lungs or apoplexy; post-partum deaths may be due to aspiration pneumonia or sepsis.

The urine in eclampsia, as in preeclampsia, is diminished or may be entirely suppressed. Casts are found, and red blood cells are usually found. Albuminuria is almost constantly present, varying in quantity from 10 to 40 grams per liter, falling as a rule to less than 1 gram per liter, within forty-eight hours after delivery.

The blood chemistry in eclampsia has been studied by a host of observers. In general we may say that the outstanding features are an increase in the uric acid and a decrease in the  $\text{CO}_2$  combining power (as low as 10 volume per cent in fatal cases), which latter demonstrates that an acidosis is almost constantly present. Blood sugar is usually increased; and blood chlorides are increased as a rule, if edema is marked. There is no appreciable increase of the non-protein or blood urea nitrogen unless there is considerable kidney damage terminally.

The pathology in eclampsia is rather clear-cut. Renal changes consist of degenerative changes in the vessels and in the epithelium of the glomeruli and convoluted tubules. Dr. E. T. Bell has described a uniform thickening of the basement membrane, causing narrowing of the capillaries. Dr. Williams considered the changes in the liver to be absolutely characteristic. The liver on cut section has a characteristic mottled appearance, due to irregularly shaped, reddish and whitish areas of hemorrhagic necrosis which on microscopic examination are found to involve the periphery of the individual lobules and the portal spaces. The brain may show edema, thrombosis or hemorrhage, while in the heart, degenerative processes in the myocardium may be in evidence.

The prognosis in eclampsia is serious, with a maternal mortality ranging between 10 per cent and 35 per cent and a fetal mortality of about 40 per cent. The prognosis is particularly bad in the face of any of the following:

1. A systolic blood pressure above 200.
2. Ten or more grams of albumin per liter.
3. Decreased urinary output or anuria.
4. Prolonged or large number of convulsions.
5. Prolonged coma.

6. Continued pulse rate above 120.
7. High or continuous temperature.
8. Absence of edema.
9. Dry skin.
10. Apoplexy.
11. Paralysis.
12. Edema of the lungs.

It is usually said that intrauterine death improves the outlook for the mother.

Any discussion of the treatment of eclampsia must give first place to the prophylaxis of eclampsia—and that is proper prenatal care. This makes possible the discovery and treatment of preeclamptic toxemia, which as we have shown, is ushered in by a definite array of symptoms and signs in a vast majority of cases. Indeed, it is evident that the real aim in treating preeclampsia is to prevent eclampsia.

On the other hand, the active or curative treatment of eclampsia, once it has manifested itself, must remain empirical and unsatisfactory, so long as we are ignorant of the etiology. For this reason authorities differ, dividing into two diametrically opposed schools of thought—the radical and the conservative. The radicals advocate emptying the uterus as soon after the first convulsion as possible. Several decades ago this was accomplished by accouchement forcé; that is, the forcible dilatation of the cervix, whatever its stage of effacement or dilatation. Then, vaginal cesarean section (or better, vaginal hysterotomy) which was first described by Dührssen in 1896, was the vogue. Now, radical treatment generally means abdominal cesarean section. At first thought, this would seem to be the logical way to quickly empty the uterus, but the results following the employment of cesarean section in eclampsia are very poor. As Williams put it: "Of one thing concerning the treatment of eclampsia I am convinced and that is that the worst possible treatment consists of the routine employment of cesarean section."

The conservative school, on the other hand, claim that the immediate operative emptying of the uterus is not only unnecessary, but harmful. Their aim is to symptomatically control the elevated blood pressure, convulsions and other toxic symptoms; to induce labor as conservatively as possible where and when it is indicated; and to avoid traumatic delivery as much as possible by not interfering until the cervix is completely dilated. Various methods have been de-



vised to accomplish this, of which the following are the outstanding:

1. The Stroganoff method which aims primarily at rest and freedom from external stimuli, and sedatives in the form of morphin and chloral hydrate, at regular specified intervals.

2. Venesection, the oldest method, consists of controlling the excessive blood pressure by the withdrawal of 750 to 1,000 c.c. of blood.

3. The Dublin method, consisting of starvation, elimination by gastric and colonic lavage, and submammary infusion of sodium bicarbonate solution.

4. The magnesium sulphate method which aims at controlling cerebral edema and toxic symptoms by the intravenous or intramuscular injection of magnesium sulphate.

5. The liver extract method or the injection of Heparhone intramuscularly at intervals until symptoms are controlled.

6. Irving of Boston introduced plasmaphoresis—withdrawing large quantities of blood, centrifuging to remove the plasma and re-introducing the red cells suspended in normal saline solution.

Statistics show that essentially as good results follow the employment of any one or any combination of the first four methods, provided no attempt at delivery is made until the cervix is fully dilated. The worst results follow cesarean section or other surgical procedures.

The plan of treatment at the University Hospital is a combination of a modified Stroganoff procedure plus other conservative methods.

While each case is individualized, the following is a sketchy outline of our treatment:

1. The patient is put to bed in a quiet, darkened room, with a private nurse in attendance. Absolute quiet is essential.

2. A hypodermic of morphin sulphate, gr.  $\frac{1}{4}$ , is given on admission.

3. One hour after admission, 30 grams of chloral, per rectum.

4. Three hours later the hypodermic of morphine sulphate, gr.  $\frac{1}{4}$ , is repeated. (Not more than  $\frac{1}{2}$  gr. in twenty-four hours.)

5. Seven, thirteen, and twenty-one hours after admission, 30 grs. of chloral hydrate per rectum.

6. The patient is carefully watched to prevent inspiration of mucus, fluid, etc.

7. She is examined medically and obstetrical-

ly, with the least possible disturbance (under nitrous oxide gas if necessary).

8. Large quantities of water are given if the patient is not markedly edematous and is conscious. If unconscious, 500 c.c. of 5 per cent glucose are given intravenously twice a day.

Our chief reliance is put upon this modified Stroganoff procedure, but occasionally we use other conservative methods as adjuvants.

9. Venesection of 750-1000 c.c. is employed, but rarely, and usually only in those cases where there is cardiac embarrassment or impending pulmonary edema.

10. Magnesium sulphate (20 c.c. of a 10 per cent solution every four hours for six doses) is sometimes used in the face of marked edema, very high blood pressure and when the patient is responding poorly to our usual treatment.

11. Hypertonic glucose is used at times, in cases of oliguria, anuria, cerebral edema and definite acidosis.

This treatment usually controls convulsions in the mild or moderate cases, and some days later, in favorable cases, labor occurs spontaneously. In most cases, however, the improvement is only temporary and therefore we usually induce labor after the primary improvement. In any event, no attempt at delivery is made until the cervix is completely dilated.

If, however, convulsions and coma continue after conservative measures and the patient is in labor—

- (a) If the cervix is fully dilated, the patient is delivered as soon as possible by forceps or version, depending upon the station of the head.

- (b) If the cervix is partially dilated and readily dilatable, the dilatation is completed manually and the child is then also delivered by forceps or version, depending on the station of the head.

Cesarean section is not undertaken in eclampsia unless there are other indications for the operation, and then not with the idea of curing the eclampsia. Plass has well shown the danger of radical methods in the treatment of eclampsia. In a study of 10,000 cases, of which 4,607 were treated radically, the mortality was 21.7 per cent, while in 5,976 which were managed conservatively, the mortality was 11.1 per cent.

In a disease as rare and as tragic as this, none of us, in the short space of a lifetime, is going to see a sufficient number of cases upon which to base an individual judgment, but this large series

with its sharp contrast should help us in forming an opinion as to what type of treatment to employ.

Finally, we must remember that our duties are not at an end when we have followed a toxemia of pregnancy to a successful delivery. Many toxic cases have some degree of kidney damage. Therefore, every such patient should

be carefully observed until the blood pressure becomes normal, albumin and casts have disappeared from the urine, and the kidney function is restored to normal. This may require weeks or months. Such observation not only guarantees the greatest possible health for the patient, but is also the basis for the advisability and prognosis of future pregnancies.

## THE CARE OF THE ALLERGIC CHILD\*

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SEVERAL years ago the suggestion was made that one day a week be set aside for the special care of the children with allergic disorders attending the Pediatric Out-patient Department of the University Hospital. During a six-month trial period the necessary materials for studying these patients were obtained, and the old cases were treated with satisfactory results. Following this, the Pediatric Allergy Clinic was established as a definite part of the Out-patient service.

New cases were admitted to the clinic after July 1, 1932. From that date to July 1, 1934, two years later, 169 children were referred to the clinic from the 2,771 new admissions of the General Pediatric Out-patient service. Of this number, twenty-eight children were not considered to be allergic, and they were referred back. The remaining 141 cases, making up about 5 per cent of the total admissions, were accepted for study and treatment.

The purpose of this paper is to describe the experiences which we had during the past two years in taking care of the allergic children. The 141 cases were distributed as follows: eczema, 43 (30.5 per cent); allergic coryza, 10 (7.1 per cent); hayfever, 19 (13.5 per cent); asthmatic bronchitis, 5 (3.5 per cent); bronchial asthma, 46 (32.6 per cent); urticaria, 15 (10.7 per cent); gastro-intestinal allergy, 3 (2.1 per cent). All of these allergic disorders may be grouped under that subheading of natural or human hypersensitiveness entitled atopy or atop-

ic hypersensitiveness. In making this statement the following classification of allergy is referred to:

- I. Anaphylaxis or anaphylactic hypersensitiveness (acquired)
  - A. In animals—experimental
  - B. In man—anaphylactic shock in a previously sensitized individual
  - C. Drug anaphylaxis in man
- II. Natural or human hypersensitiveness
  - A. Serum allergy (or sickness)
  - B. Drug allergy (or idiosyncrasy)
  - C. Atopy or atopic hypersensitiveness (hereditary)
    1. Allergic dermatitis or eczema
    2. Allergic coryza due to
      - a. Inhalants
        - (1) Animal emanations
        - (2) Pollens (hayfever or pollinosis)
        - (3) Powders and perfumes
      - b. Foods and drugs
      - c. Bacterial products of infection
    3. Bronchial asthma due to
      - a. Inhalants
      - b. Foods and drugs
      - c. Bacterial products
    4. Other allergic conditions
      - a. Urticaria (and angioneurotic edema)
      - b. Gastro-intestinal allergy (food allergy)
      - c. Allergic migraine
      - d. Purpura (Henoch's)
      - e. Some cases of epilepsy

\*From the Department of Pediatrics, University of Minnesota. Presented before the Northwestern Pediatric Society at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 16, 1934.

## D. Serum and drug shock in the atopic individual

## III. Hypersensitiveness in infection (acquired)

## A. Bacterial allergy or hyperergasia

1. Tuberculosis
2. Allergy has been considered in
  - a. Rheumatic fever
  - b. Scarlet fever
  - c. Nephritis
  - d. Lobar pneumonia

## B. Fungous and parasitic infections may produce allergic reactions.

The name atopy, which means "a strange disease" was coined by Coca, a leading American investigator in the field of allergy. He included all those clinical forms of hypersensitiveness which occur so far as is known only in human beings and which are subject almost entirely to inheritance.

The first clinical forms included in this category were hayfever and bronchial asthma. Later eczema was added. More information led to the inclusion of allergic coryza, and then urticaria and gastro-intestinal allergy were added. An attempt is now being made to include allergic migraine, purpura (Henoch's) and some cases of epilepsy.

The substance to which the atopic individual responds in an abnormal way are called "atopens," and they may be proteins or non-proteins. These individuals react with specific bodies which may be found in the blood of nearly all cases. Whether these bodies which have been called atopic reagins are true antibodies developed immunologically under antigen stimulation or physiological products like the natural hemagglutinins and hemolysins is not known.

In atopic hypersensitiveness heredity seems to play an outstanding part. It has been observed that by the tenth year of life atopic symptoms have appeared in 89 per cent of the atopic offsprings under a bilateral hereditary influence, in 35 per cent of those subject to a unilateral influence, and in only 20 per cent of those with a negative family history. Asthma and related conditions are transmitted as a Mendelian dominant. The greater the heredity the earlier are symptoms manifested, and the earlier in life the individual becomes sensitive the greater the tendency to multiple sensitization.

The atopic children were handled in the allergy clinic in a rather simple manner. Nothing elaborate was attempted. An effort was made to follow some definite program in searching for the cause of the allergic disorder. First of all, a very complete history was obtained. It was observed that in many instances a good history was really the key to success in the treatment. Special emphasis was placed on the time of onset, the outstanding symptoms, the course of the disease from month to month, or year to year, the previous allergic disorders, the associated or concomitant allergic disorders, and the family history. A search was made for allergic disorders among immediate members of the family and blood relations. Several history outlines were tried in obtaining good records but none was found to be quite as satisfactory as that of Rowe presented in his monograph entitled "Food Allergy." His outline as applied to asthma is as follows:

"A. Past History. 1. Onset of asthma. Age? Month or season of the year? Gradual or sudden? Was there a history of catarrhal congestion in the nose or eyes, repeated or chronic, bronchitis or wheezing before asthma began? Did any acute infection or operation precede asthma? If eczema, urticaria or angioneurotic edema occurred prior to or after the onset of asthma, state the time of onset and duration of each.

"2. Course of asthma. Describe the asthmatic state from its inception to the present time with reference to the frequency and duration of attacks. Were attacks initiated by nasal congestion, sneezing, pharyngeal irritation, nasal, conjunctival or pharyngeal itching, fever, irritability, nervousness, nausea or vomiting? Was asthma intermittent or continuous? Describe the attacks themselves in relation to duration and severity of wheezing, coughing, amount and type of expectoration, fever and time required for recovery. Has any relief occurred from change of climate?

"3. Concomitant allergic symptoms: Recurrent head colds, croup, seasonal or perennial hayfever, urticaria, angioneurotic edema, pruritus, eczema, bronchitis, headaches, migraine, gastro-intestinal symptoms, including canker sores, buccal membrane films, heavy breath, coated tongue, globus hystericus, anorexia, distention, pyrosis, regurgitation, belching, nausea, vomiting, cyclic vomiting, epigastric heaviness or distress, abdominal pain or soreness in the upper left, lower left, epigastric, umbilical or midlower areas of the abdomen, colicky or constant pain, radiation of pain, mucous colitis, constipation, colonic soreness, proctitis, pruritus ani, bladder distress, chafing of thighs, irritation of the vulva, weakness, fatigue, mental confusion, irritability, depression. Describe the course and degree of any of these in the patients.

"4. Infancy: How long breast-fed? First bottle, its contents and whether it was continued? When were other foods added? Was there any colic, gastro-intestinal disturbances, pylorospasm, food distastes or disagreements or feeding difficulties?

"5. Food dislikes or disagreements: Do any foods definitely disagree or cause any symptoms? Are there any dislikes for foods?

"6. Environmental contact and exposure: Are any definite symptoms noticed from house dust, animal contacts, various types of pillows or mattresses, furs or special furnishings? Are there any effects from changes of temperature or weather? What are the occupations of various members of the family? Are there any barns, chicken-yards, animals, flower gardens, trees or forests near the house? Is the house old or new? Has it hardwood floors or carpets? Is it damp or musty? What sort of furnishing and carpets are there?

"B. Family History. Was there a history of seasonal or perennial hayfever, recurrent head colds or bronchitis, bronchial asthma, urticaria, angioneurotic edema, eczema, bilious attacks, recurrent headaches or migraine, gastro-intestinal symptoms similar to those enumerated above in the father, mother, brothers, sisters, maternal or paternal grandfather, grandmother, aunts or uncles? Were there any other chronic diseases in these relatives?"

Each patient received a complete physical examination with special emphasis being placed on a careful observation of the nose and throat. A note was made as to whether the tonsils and adenoids had already been removed. A record was also kept of the number of sinus or antrum punctures the patient had received. Roentgenograms of the paranasal sinuses and the lungs were obtained in all cases with allergic disorders of the respiratory tract. Blood studies were made, and the differential counts were closely followed. As a whole very few outstanding physical defects were found among the allergic children, the only exception being the barrel-chests with emphysema present in some with chronic asthma.

Cutaneous tests were next applied. The glycerinated fluid extracts of the various atopens or allergens were used. The material is furnished in capillary tubes, there being enough of the fluid extract in each tube for one test. In this way there is no danger of contamination or spilling which occasionally occurs with the dry extracts. There is also no need for the hypodermic needles, syringes and cleansing solutions which are so essential in performing the intradermal tests.

The tests were applied by the pressure-puncture method. This was found to be the best method for infants and small children, especially when they would not remain quiet. The skin was cleansed with alcohol or ether, and after evaporation, the extract was expelled from the glass capillary tubes upon the cleansed skin at intervals of about four centimeters. Holding a sterile sewing needle nearly parallel with the skin, four oblique pricks or shallow punctures were made through the epidermis by pressing the point of the needle through each drop of extract. A new needle was used for each test. The punctures were confined to an area not more than three millimeters in diameter.

Sufficient fluid extract to produce a positive reaction in susceptible children was carried into the skin by these multiple punctures, and so in a few minutes the excess fluid on the surface of the skin was lightly wiped off. A similar test was carried out with a control glycerine solution and only those reactions in the test sites which were distinctly greater in intensity than that resulting from the control test were considered positive. The positive reactions (urticarial wheal surrounded by a zone of erythema) usually appeared in sensitive patients in 20 to 30 minutes.

From several hundred allergens, only eighty were chosen to represent our set of cutaneous tests. This was considered to be a sufficient number for the satisfactory testing of allergic children. The various allergens were divided into three groups: ingestants, inhalants, and pollens. The complete list follows. The ingestants or food allergens are grouped according to botanical classifications, and the pollens have been assembled under their various groups.

When the results of the cutaneous tests were negative or unsatisfactory, the so-called elimination of trial diets were tried. In the older infant and in the young child, these diets were often very valuable. Numerous diets eliminating various foods were used. It was found that in the majority of the cases one or more of the following foods were responsible for the allergic manifestations: milk, cheese, egg, whole wheat, white potato, chocolate, tomato and orange. If the removal of these foods did not give satisfactory results, then diets eliminating beef, oatmeal, rye, peas, beans, spinach or apple were tried.

Some of the children who came to the allergy



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## Ingestants

1. Beef
2. Pork
3. Lamb
4. Egg
5. Milk
6. Cheese
7. Codfish
8. Chicken
9. Wheat
10. Oat
11. Rye
12. Cornmeal
13. Sweet Corn
14. Barley
15. Rice
16. Carrot
17. Celery
18. Potato
19. Tomato
20. Lima Bean
21. Navy Bean
22. String Bean
23. Green Pea
24. Peanut

## 25. Squash

26. Asparagus
27. Onion
28. Cabbage
29. Cauliflower
30. Lettuce
31. Beets
32. Spinach
33. Buckwheat
34. Rhubarb
35. Pear
36. Apple
37. Apricot
38. Peach
39. Prune
40. Plum
41. Lemon
42. Orange
43. Grapefruit
44. Grape
45. Raisin
46. Pineapple
47. Banana
48. Tapioca
49. Chocolate

## Inhalants

1. Cat Dander
2. Cow Dander
3. Dog Dander
4. Horse Dander
5. Sheep Dander
6. Feathers (mixed)
7. Orris Root
8. Cotton Seed
9. Flax Seed
10. Kapok Seed
11. Silk
12. Pyrethrum
13. Tobacco
14. Glue
15. House Dust

## Pollens

### Trees

1. Poplar
2. Ash and Oak

### Grasses

3. Sweet Vernal
4. Timothy
5. Redtop
6. June Grass
7. Orchard Grass
8. Perennial Rye

## 9. Rye Pollen

10. Johnson Grass

## Plantain

11. Common Plantain

## Dock or Sorrel

12. Yellow Dock

## Alfalfa-Clover

13. Alfalfa

## Pigweeds

14. Redroot
15. Careless Weed
16. Western Water Hemp
17. Spiny Amaranth

## Russian Thistles

18. Russian Thistle
19. Lambs Quarters

## Sage-Wormwoods

20. Sage Brush
21. Pasture Sage
22. Mugwort

## Ragweeds

23. Combined Ragweed
24. Western Ragweed
25. Cocklebur
26. Marsh Elder

clinic had already been placed on various trial diets by the family physician. The results had not been very good. In a number of these cases, it was found that the parents were not making a complete elimination of the offending food. In one instance, although the mother did not give her child eggs, she was feeding him macaroni or spaghetti about every other day. She had been told to place the child on an absolutely egg-free diet. In another case, rye bread containing wheat flour was being eaten in fairly large amounts by a child who was supposed to be on a wheat-free diet. From experiences such as these, it became apparent that success in connection with the trial diets depended in many instances upon the thoroughness with which they were carried out by the parents. A great deal of time was therefore taken in explaining each diet in detail, emphasizing especially all sources of error.

The diagnostic procedures mentioned above were applied to the majority of the children studied in the clinic. For economy of space and for the sake of clearness, the data obtained from all the histories, physical examinations, cu-

taneous tests, and elimination diets together with the treatment which was instituted has been condensed into eight tables which are practically self-explanatory. They will now be briefly considered in their natural order.

Table I represents the data obtained from the children with eczema. There was an equal distribution as far as sex was concerned. The majority of the patients came to us before the sixth year of life, and in four-fifths of the patients the onset was early, that is in the first year of life. There were very few associated allergic disorders and the family history was negative in more cases than positive. The physical examination usually revealed nothing outstanding beside the eczema. The cutaneous tests were positive in a little over half the children. Although there were many positive tests, only a certain number of them were of definite value in the treatment of eczema (Table VI). In only one instance was a contactant considered responsible for the eczema.

The group with negative cutaneous tests was placed on elimination or trial diets. After the offending food or foods were located, every ef-

# THE ALLERGIC CHILD—STOESSER AND SHAPERMAN

TABLE I. ECZEMA—43 CASES (30.5 PER CENT)

1. Sex: Male.....	21	9. Cutaneous Tests	
Female .....	22	Positive .....	25
		Negative or refused.....	18
2. Age at First Visit		10. Treatment	
Below 1 year.....	12	Positive skin tests	
1 to 5 yrs., incl.....	17	Removal from diet of	
6 to 10 yrs., incl.....	7	Egg .....	2
11 to 15 yrs., incl.....	7	Egg, wheat and milk (powdered milk used) .....	2
3. Age at Onset		Egg, wheat and chocolate.....	1
Below 1 year.....	35	Egg and milk.....	1
1 to 5 yrs., incl.....	3	Wheat .....	2
11 to 15 yrs., inc.....	2	Wheat and oatmeal.....	1
4. Previous Allergic Disorders .....	0	Milk .....	2
5. Associated Allergic Disorders		Tomato and orange.....	1
Bronchial Asthma .....	1	Orange and chocolate.....	1
Hayfever .....	1	Chicken and cheese.....	1
6. Family History		Removal of silk.....	1
Positive .....	16	Referred into hospital.....	8
Negative .....	27	Treatment unsuccessful.....	2
7. Physical Examination		Negative or no skin tests	
Overweight .....	2	Elimination diets used with removal from diet of	
8. Eosinophile Diff. Count		Egg .....	3
Below 5 per cent.....	32	Egg and wheat.....	2
5 to 10 per cent.....	9	Egg, wheat and milk.....	1
Over 10 per cent.....	2	Egg and potato.....	1
		Milk .....	1
		Milk and potato.....	1
		Tar alone very effective.....	2
		Referred into hospital.....	3
		Treatment unsuccessful.....	4

NOTE: In this table and the succeeding ones the numerals in each column indicate the number of cases.

TABLE II. ALLERGIC CORYZA—10 CASES (7.1 PER CENT)

1. Sex: Male .....	6	9. Maxillary Sinus Roents.	
Female .....	4	Positive .....	3
		Negative .....	7
2. Age at First Visit		10. Eosinophile Diff. Count	
Below 1 year.....	0	Below 5 per cent.....	7
1 to 5 yrs. incl.....	3	5 to 10 per cent.....	0
6 to 10 yrs. incl.....	3	Over 10 per cent.....	3
11 to 15 yrs. incl.....	4	11. Cutaneous Tests	
3. Age at Onset		Positive .....	3
Below 1 year.....	0	Negative .....	7
1 to 5 yrs. incl.....	6	12. Treatment	
6 to 10 yrs. incl.....	4	Skin tests of value	
4. Previous Allergic Disorders		Symptom free after the removal of	
Infantile Eczema.....	3	Egg and feathers.....	1
5. Associated Allergic Disorders		Cat Dander.....	1
Bronchial Asthma.....	2	Skin tests of no value and elimination diets used	
Chronic Eczema.....	1	Improvement followed after the removal from diet of	
6. Family History		Egg .....	2
Positive .....	8	Egg and wheat.....	1
Negative .....	2	Egg, wheat and milk.....	1
7. Physical Examination		Wheat .....	1
Large tonsils.....	1	Wheat and potato (sinus drainage).....	1
Ear infection.....	1	Skin tests negative and no improvement with the use of the elimination diets.....	2
8. Tonsils (at first visit)			
Present .....	3		
Removed .....	7		

# THE ALLERGIC CHILD—STOESSER AND SHAPERMAN

TABLE III. HAYFEVER OR POLLINOSIS—19 CASES (13.5 PER CENT)

1. Sex: Male .....	18	8. Tonsils (at first visit)	
Female .....	1	Present .....	12
		Removed .....	7
2. Age at First Visit		9. Maxillary Sinus Roents.	
Below 1 year.....	0	Positive .....	12
1 to 5 yrs. incl.....	2	Negative .....	7
6 to 10 yrs. incl.....	12		
11 to 15 yrs. incl.....	5	10. Eosinophile Diff. Count	
3. Age at Onset		Below 5 per cent.....	9
Below 1 year.....	0	5 to 10 per cent.....	8
1 to 5 yrs. incl.....	12	Over 10 per cent.....	2
6 to 10 yrs. incl.....	7		
4. Previous Allergic Disorders		11. Cutaneous Tests	
Infantile Eczema.....	2	Positive .....	16
Bronchial Asthma.....	2	Unsatisfactory .....	1
Urticaria .....	1	Refused .....	2
5. Associated Allergic Disorders		12. Treatment	
Bronchial Asthma.....	4	Desensitization—good results	
Bastro-intestinal .....	2	Grasses .....	1
Urticaria .....	1	Weeds (ragweed group).....	5
		Grasses and weeds.....	2
		Desensitization in progress the first time.....	3
		Desensitization refused.....	4
6. Family History			
Positive .....	12	Moved from Minnesota to	
Negative .....	7	Washington State.....	1
		Canada .....	1
7. Physical Examination		No treatment (cases mild and wish to see if	
Large tonsils.....	2	symptoms repeat).....	2
Ichthyosis .....	1		

TABLE IV. ASTHMATIC BRONCHITIS—5 CASES (3.5 PER CENT)

## ACUTE BRONCHITIS WITH ASTHMA

1. Sex: Male .....	3	9. Maxillary Sinus Roents.	
Female .....	2	Positive .....	1
		Negative .....	4
2. Age at First Visit		10. Eosinophile Diff. Count	
Below 1 year.....	0	Below 5 per cent.....	3
1 to 5 yrs. incl.....	0	5 to 10 per cent.....	2
6 to 10 yrs. incl.....	0		
11 to 15 yrs. incl.....	1	11. Cutaneous Tests	
3. Age at Onset		Positive (eczema case).....	1
Below 1 year.....	1	Negative .....	4
1 to 5 yrs. incl.....	3		
6 to 10 yrs. incl.....	1	12. Treatment	
4. Previous Allergic Disorders	0	<i>Skin tests of no value</i>	
5. Associated Allergic Disorders		The following symptomatic treatment for	
Eczema .....	1	acute bronchitis carried out.....	5
6. Family History		Rest	
Positive (eczema case).....	1	High vitamin diet	
Negative .....	4	Ephedrine inhalant	
		(diluted to 0.2-0.4%)	
7. Physical Examination		Steam inhalations	
Upper respiratory infection with acute bron-		Cough sedatives (codein)	
chitis .....	5	Belladonna	
Acute tonsillitis.....	1	Expectorants such as ipecac and pot. iodide	
8. Tonsils (at first visit)		Ephedrine with sedatives	
Present .....	5		
Removed .....	0		

Tonsils and adenoids also removed in one case

Gradually with each attack of bronchitis the asthma became less and less severe

# THE ALLERGIC CHILD—STOESSER AND SHAPERMAN

TABLE V. BRONCHIAL ASTHMA—46 CASES (32.6 PER CENT)

1. Sex: Male .....	29	11. Cutaneous Tests	
Female .....	17	Positive .....	33
		Negative or refused.....	13
2. Age at First Visit		12. Treatment	
Below 1 year.....	0	<i>Positive tests of value</i>	
1 to 5 yrs. incl.....	10	Removal of foods	
6 to 10 yrs. incl.....	20	Wheat .....	2
11 to 15 yrs. incl.....	16	Milk .....	1
		Grape .....	1
3. Age at Onset		Removal of inhalants	
Below 1 year.....	10	Horse dander.....	3
1 to 5 yrs. incl.....	27	House dust.....	2
6 to 10 yrs. incl.....	8	Cat dander.....	1
11 to 15 yrs. incl.....	1	Feathers .....	1
		Feathers and dog.....	1
4. Previous Allergic Disorders		Orris root.....	1
Infantile Eczema.....	16	Fish glue.....	1
Hayfever .....	6		
Urticaria .....	2	Removal of foods and the inhalants	
5. Associated Allergic Disorders		Egg and feathers.....	1
Hayfever .....	8	Wheat, oatmeal, peas and feathers.....	1
Urticaria .....	6		
Chronic Eczema.....	4	Desensitization	
6. Family History		Grasses .....	2
Positive .....	32	Weeds (ragweed).....	4
Negative .....	14	Grasses and weeds.....	1
7. Physical Examination		Removal of foods and desensitization.....	2
Barrel-chest .....	8	<i>Positive tests of no value</i>	
Malnutrition .....	7	Pot. iodide and belladonna gave the most relief .....	2
Large tonsils.....	5	Tonsillectomy and adenoidectomy with sinus drainage .....	2
Adolescent goiter.....	1	Moved to Washington State.....	1
8. Tonsils (at first visit)		All forms of treatment unsuccessful.....	3
Present .....	33	<i>Tests negative or refused</i>	
Removed .....	13	Removal of	
9. Maxillary Sinus Roents.		Egg .....	1
Positive .....	25	Egg, wheat, wool and feathers.....	1
Negative .....	21	House dust.....	1
10. Eosinophile Diff. Count		Tonsillectomy and adenoidectomy.....	2
Below 5 per cent.....	20	All forms of treatment unsuccessful.....	8
5 to 10 per cent.....	16		
Over 10 per cent.....	10		

fort was made in watching closely that these foods were kept entirely out of the child's diet from day to day. At the same time the general health of the patient was considered. The elimination diet was checked carefully in order to be sure that the infant or child received the proper number of calories, a sufficient amount of the minerals such as calcium and phosphorus, and an adequate supply of vitamins. In some instances, milk could gradually be returned to the diet in the form of evaporated milk or a powdered milk. The so-called non-allergic milks were very poorly taken.

In two cases, there was marked improvement from the external application of crude coal tar (2 per cent) in zinc paste. The patients which

were referred into the hospital ranged in age from six months to eighteen months. They were selected as ideal cases for a special study of the blood lipids which was being conducted in the hospital. They did not represent failures on our part. There were, however, in all six cases which yielded to none of the various methods of treatment instituted. They were chiefly older children who had had eczema for many years.

The allergic disorders with predominant nasal manifestations are considered in Tables II and III. There is allergic coryza with its characteristic perennial history, and hayfever or pollinosis with its strong seasonal occurrence. The incidence of these disorders appears to be greater in the males than in the females. Although



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TABLE VI. DISTRIBUTION OF SKIN SENSITIVENESS TO THE VARIOUS ALLERGENS

Eczema	A	B	Hayfever	A	B	Asthma	A	B		
Egg.....	14	6	Comb. Ragweed..	15	10	Wheat.....	7	4	House Dust.....	8 2
Wheat.....	10	5	Cocklebur.....	14	10	Oat.....	5	2	Horse Dander....	7 3
Milk.....	9	4	Marsh Elder.....	11	10	Egg.....	5	1	Feathers.....	6 4
Oat.....	6	..	West. Ragweed..	10	10	Peanut.....	5	..	Sheep Dander....	4 ..
Barley.....	3	..				Cornmeal.....	4	2	Cat Dander.....	2 1
Spinach.....	3	..	Pasture Sage....	9	..	Pork.....	4	..	Dog Dander.....	2 1
Rice.....	2	..	Sage Brush.....	7	..	Sweet Corn....	3	2	Kapok Seed.....	2 ..
Rye.....	2	..	Mugwort.....	6	..	Rice.....	2	1	Silk.....	2 ..
Potato.....	2	..				Barley.....	2	..	Cotton Seed.....	1 ..
Green Pea....	2	..	Sweet Vernal....	7	4	Milk.....	2	1	Flax Seed.....	1 ..
Tomato.....	2	1	June Grass.....	6	4	Chicken.....	2	..	Orris Root.....	1 1
Orange.....	2	2	Orchard Grass..	6	4	Beef.....	2	..	Fish Glue.....	1 1
Chocolate....	2	2	Timothy.....	5	4	String Bean....	2	..	Tobacco.....	1 ..
Chicken.....	1	1	Redtop.....	5	4	Potato.....	2	1	Comb. Ragweed..	10 6
Lamb.....	1	..	Johnson Grass..	5	4	Cabbage.....	2	..	Sage Brush.....	6 1
Pork.....	1	..	Perennial Rye..	4	..	Rye.....	1	..	Orchard Grass..	5 4
Beef.....	1	..	Rye Pollen.....	3	..	Buckwheat.....	1	..	Redroot.....	5 ..
Cornmeal.....	1	..				Codfish.....	1	..	Careless Weed...	5 ..
Cheese.....	1	1	Alfalfa.....	2	..	Lamb.....	1	..	Sweet Vernal....	4 4
Buckwheat....	1	..				Navy Bean.....	1	1	Redtop.....	4 4
Navy Bean....	1	..	Water Hemp....	2	..	Green Pea.....	1	1	June Grass.....	4 4
String Bean...	1	..	Spiny Amaranth.	2	..	Lettuce.....	1	..	Lambs Quarters..	4 ..
Apple.....	1	..				Spinach.....	1	..	Pasture Sage....	4 1
Prune.....	1	..	Russian Thistle..	2	..	Cauliflower....	1	..	Johnson Grass..	3 3
Peanut.....	1	..	Lambs Quarters..	2	..	Asparagus.....	1	..	Water Hemp....	3 ..
						Peach.....	1	..	Russian Thistle..	3 ..
Silk.....	2	1	Poplar.....	2	..	Pear.....	1	..	Cocklebur.....	3 3
Flax Seed....	1	..				Pineapple.....	1	..	Marsh Elder....	3 3
Kapok Seed....	1	..				Grape.....	1	1	Timothy.....	2 2
									Yellow Dock....	2 ..
									West. Ragweed..	2 ..

A—Number of positive cutaneous tests for each allergen.

B—Number of times the positive reaction of definite assistance in treatment.

allergic coryza was more or less equally distributed through the various age periods, the cases of pollinosis were largest in number during the early school years. However, the onset of the disorders dated back in almost two-thirds of the children to the preschool period. This is interesting in view of the fact that there has been a feeling that nasal allergy is not so important during this early age period. Infantile eczema was present in some instances as a previous allergic disorder, while bronchial asthma was most important as an associated allergic disorder. The family histories were positive more often than negative. Significant was the observation that in many instances one or both parents gave a history of nasal allergy.

A tonsillectomy had been performed in many of the cases of allergic coryza. Some of the hayfever patients had also had their tonsils removed. In each instance there was no improvement. In fact, some of them became worse.

The maxillary sinus roentgenograms were definitely more positive in the children with pollinosis than in those with allergic coryza. This may have been due to the fact that the reaction of the nasal mucosa to the allergens was definitely greater in the hayfever cases. As a result the mucosa of the sinuses was also probably markedly swollen giving on roentgenogram examination the appearance of infected sinuses. A few of these subjects had had sinus or antrum punctures before coming to the allergy clinic. The results were of course unsatisfactory.

The cutaneous tests were chiefly negative in the children suffering with allergic coryza. We were therefore forced to use the elimination diets and had fairly good success. In fact the response to the trial diets was considered one of the most significant observations of the two year study. On the other hand, in the subjects with pollinosis the cutaneous tests were usually positive with a great deal of accuracy. Desensiti-

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TABLE VII. URTICARIA—15 CASES (10.7 PER CENT)

1. Sex: Male .....	6	9. Maxillary Sinus Roents.	
Female .....	9	Positive .....	0
		Negative .....	15
2. Age at First Visit		10. Eosinophile Diff. Count	
Below 1 year.....	2	Below 5 per cent.....	13
1 to 5 yrs. incl.....	5	5 to 10 per cent.....	2
6 to 10 yrs. incl.....	3		
11 to 15 yrs. incl.....	5		
3. Age at Onset		11. Cutaneous Tests	
Below 1 year.....	4	Positive .....	3
1 to 5 yrs. incl.....	6	Negative .....	8
6 to 10 yrs. incl.....	3	Unsatisfactory .....	4
11 to 15 yrs. incl.....	2		
4. Previous Allergic Disorders		12. Treatment	
Infantile Eczema.....	1	<i>Skin tests of value</i>	
5. Associated Allergic Disorders		Symptom free after the removal of tomato, carrot, orange, apple, chocolate.....	1
Gastro-intestinal .....	3	<i>Skin tests of no value, negative or unsatisfactory</i>	
6. Family History		Elimination diets used with relief after removal of	
Positive .....	5	Egg and wheat.....	1
Negative .....	10	Egg, wheat, potato, tomato, orange and chocolate .....	2
7. Physical Examination		Egg, milk and spinach.....	1
Large tonsils.....	1	Milk .....	1
Many dental caries.....	1	Tomato .....	2
8. Tonsils (at first visit)		Tomato and orange.....	1
Present .....	13	Removal of wool.....	1
Removed .....	2	Avoidance of heat (hot baths).....	2
		Alkaline ash diet and alkali.....	1
		Treatment unsuccessful.....	2

zation relieved the majority of the children who received this form of treatment. The pollens used in producing the state of hyposensitization are listed in column B under hayfever in Table VI. Two patients were sensitive to so many grasses and weeds that desensitization was not attempted but instead arrangements could fortunately be made to move these children to other parts of the continent. Here they obtained relief.

In Tables IV and V is condensed all the data obtained from a thorough review of the cases who were admitted to the clinic with a diagnosis of asthmatic bronchitis and bronchial asthma. The males, it will be observed, predominated. The asthmatic bronchitis appeared chiefly during the preschool period of childhood and four-fifths of the cases of bronchial asthma had their onset before the sixth year of life although many of them did not come for medical care until later in childhood. With nothing significant observed as far as previous and associated allergic disorders and family history are concerned in connection with asthmatic bronchitis, it was interesting to note the high incidence of infantile eczema as a previous allergic disorder and of

hayfever and urticaria as associated allergic disorders in the bronchial asthma cases. Heredity seemed to play a very important part in that over two-thirds of the patients with bronchial asthma had a positive family history. In fact, here appeared an allergic disease in which there was a high incidence of bilateral hereditary influence with a corresponding early onset of symptoms in the offsprings.

The so-called asthmatic bronchitis cases all had attacks of upper respiratory infections. Very often the naso-pharyngitis extended to the bronchi. The acute bronchitis was accompanied by a great deal of difficulty in breathing. Some of the children became cyanotic for short periods of time. The cyanosis alarmed the parents and it was the chief reason for the child's visit to our clinic.

A thorough examination revealed nothing significant outside of an infection of the respiratory tract. This infection frequently was quite mild in the nose and throat, but more severe in the bronchi. The roentgenograms of the maxillary sinuses were usually negative. The cutaneous tests were also negative and therefore of no definite assistance in the treatment.

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TABLE VIII. GASTRO-INTESTINAL ALLERGY—3 CASES (2.1 PER CENT)

1. Sex: Male .....	0	9. Maxillary Sinus Roents.	
Female .....	3	Positive .....	0
		Negative .....	3
2. Age at First Visit		10. Eosinophile Diff. Count	
Below 1 year.....	0	Below 5 per cent.....	2
1 to 5 yrs. incl.....	1	5 to 10 per cent.....	1
6 to 10 yrs. incl.....	0		
11 to 15 yrs. incl.....	2		
3. Age at Onset		11. Cutaneous Tests	
Below 1 year.....	0	Positive .....	1
1 to 5 yrs. incl.....	1	Negative .....	2
6 to 10 yrs. incl.....	2		
4. Previous Allergic Disorders .....	0	12. Treatment	
5. Associated Allergic Disorders .....	0	<i>Skin tests of value</i>	
6. Family History		Symptom free after the removal of	
Positive .....	1	Cheese .....	1
Negative .....	2	<i>Skin tests of no value and elimination diets used</i>	
7. Physical Examination			
Large tonsils.....	1	Improvement followed after the removal	
8. Tonsils (at first visit)		from diet of	
Present .....	3	Milk and wheat.....	1
Removed .....	0	Wheat and chocolate.....	1

Before treatment the subjects had vomiting and abdominal pain or colic. One case complained of headaches.

The treatment was essentially that of acute bronchitis. Nothing specific was carried out. In the one patient with rather severe attacks of acute tonsillitis, the tonsils and adenoids were removed. This was followed by marked improvement. In spite of the lack of any specific treatment, all the children, as they grew older, had fewer asthmatic attacks in association with their respiratory infection. In a few instances, we found that the asthma had entirely disappeared during our two year period of observation.

The most common physical findings in the asthmatic children were barrel-chest and malnutrition. The barrel-chest was found in patients in which the restriction of the free passage of air through the bronchi was more or less a constant thing. Malnutrition existed in those cases in which the children were so fatigued by the repeated asthmatic attacks that they had very little desire to eat. In fact some of them felt better if they ate only small meals. The average duration of the asthma in the cases with physical defects was seven and one-half years while in the children with no defects, the period was four years.

The roentgenogram studies were of little help in the asthma cases. On the other hand, the

cutaneous tests, which were positive in a little over two-thirds of the patients, were of value in the majority of the children. The incidence of positive reactions of definite assistance in the treatment can be observed in Table VI under asthma in column B. In a certain number of cases, foods were responsible for this allergic condition and they had to be removed completely from the diet. In other instances, inhalants caused the attacks. Still another group reacted to both foods and inhalants, and there were also children who had hayfever and quite severe asthma. They were sensitive to pollens and desensitization gave very good results. In two cases, the removal of certain foods from the diet plus desensitization was necessary in order to give complete relief. One boy was sensitive to so many foods, inhalants and pollens, especially the latter, that arrangements were made for his removal to Washington State. Improvement followed this change in environment in that he now has only occasionally an asthmatic attack.

A small number of children had positive tests which were of no value in the treatment (Table V). Two of these patients were greatly relieved by medication, two had very large tonsils, and improved after tonsillectomy and adenoidectomy

with sinus drainage, and three cases refused to respond to any form of treatment. They are still under observation.

On the other hand, in the children with negative cutaneous tests, the trial or elimination diets and a careful study of the child's environment were of some value. Three patients were relieved. Two cases with large tonsils had less asthma after tonsillectomy and adenoidectomy. All forms of treatment were unsuccessful in eight children, making a total of eleven cases (24 per cent) in which progress was not good. Thirty-five children (76 per cent) were however definitely helped.

A review of the cases of urticaria and gastrointestinal allergy is presented in Tables VII and VIII. The two allergic disorders have many things in common. The females predominated in both diseases. The family histories were more often negative than positive. The maxillary sinus roentgenograms were negative. Cutaneous tests indicated specific sensitivity in only a small number of patients. In fact, the tests were of value in treatment in only one case for each disease. The elimination diets were of greater assistance. Many children improved when they were used. Two cases of urticaria failed to respond to any form of treatment.

The blood studies made in all the allergic disorders were carefully recorded. Special attention was given to the eosinophile differential counts. They were, however, found to vary a great deal. In some cases, the count was rather high during the allergic reaction and low after it had subsided. In other instances it was low during the height of the allergic manifestation and high shortly after improvement had occurred. A few children showed no change in the count during or after the allergic disorder. The patients with asthma had usually the highest counts, while the cases of eczema had very little elevation.

### Summary and Conclusions

1. A clinical review of the study made and the treatment carried out in 141 children with allergic disorders which were referred to the Pediatric Allergy Clinic over a two year period has been presented.

2. The allergic diseases encountered were eczema, allergic coryza, hayfever, asthmatic bronchitis and bronchial asthma, urticaria and gastrointestinal allergy. They belong to that section of a newer classification of allergy entitled natural or atopic hypersensitiveness characterized by a strong hereditary tendency.

3. Our experience in the care of the allergic children has indicated that there were a large number of cases which received satisfactory relief. In obtaining this result, no elaborate methods of diagnosis were used, but instead a few rather simple procedures were followed. All were considered of equal importance and are as follows:

- a. A very complete history
- b. Cutaneous tests
- c. Elimination or trial diets

4. Treatment involved the thorough removal of the offending foods from the diet, or the irritating inhalants from the child's environment. Pollen allergy responded very well to proper and careful desensitization.

5. A small number of patients required surgical treatment in order to obtain relief.

6. Success depended upon the avoidance of all haste in the diagnosis and treatment. Delays in relieving the child were often necessary because histories had to be retaken, cutaneous tests repeated, and trial diets rearranged. A rather exhaustive search was conducted for the offending allergen or allergens, and an effort was made to avoid placing the patient on some form of drug therapy, thereby dismissing the search.



# CASE REPORTS

## UNUSUALLY LARGE BILATERAL RENAL CALCULI

E. W. EXLEY, M.D.

Minneapolis

Numerous reports of unusually large renal and ureteral calculi appear throughout the literature. Many of these calculi have been removed at operation or have been recovered at the autopsy table, and the literature contains a record of their dimensions and

hematuria in July she had been under the care of a chiropractor. She had some vomiting during the two months previous and she thought that she had lost considerable weight. She had had no operations or previous serious illnesses.

Examination revealed an adult female who had apparently undergone a considerable loss of weight. The physical examination was negative excepting for the abdomen which showed large bilateral masses in both flanks. These masses were nodular and tender to palpation, the right being the less tender of the two. Both masses moved with respiration and showed marked tenderness to Murphy percussion. The measurements of these masses were: left 24 cm. vertical x

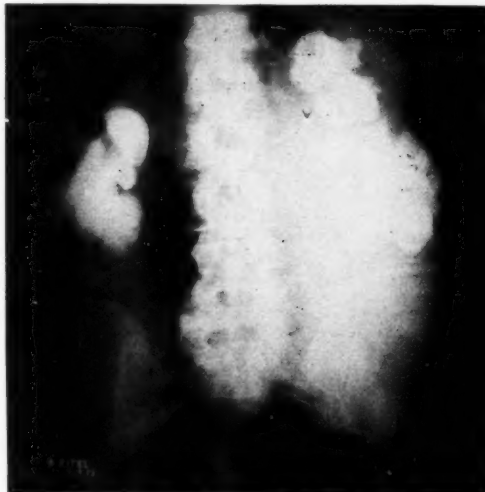


Fig. 1. X-ray showing large calculi with shadows in the course of the ureter on the left and a cluster of shadows overlying the lower pole of the right kidney.



Fig. 2. Pyelogram of the right kidney showing complete calculous filling of the renal pelvis and the dilated calyces. No media is seen to have passed the shadows lying in the course of the left ureter.

weights. I wish to report the following unique occurrence of unusually large bilateral renal calculi unaccompanied by any severe symptom complex until relatively late in its course. Unfortunately the patient was not operated upon and an autopsy was not obtained.

Mrs. O., a white woman aged sixty-five, was first seen on December 28, 1934. She appeared to be somewhat confused mentally and a detailed history was not easily obtained. She stated that she had noted an indefinite abdominal pain for the past year or two. During the winter of 1933-34 these pains became more severe and constant, but she could not say whether or not the pain was worse on one side or the other. In April, 1934, she became aware of a mass in the left flank which was gradually becoming more tender. In July she first noted hematuria which has been more or less constant since that time. This hematuria was unaccompanied by any aggravation of her urinary symptoms. As well as the patient could remember she had urinary frequency and nocturia twice a night for at least eight years. Since the appearance of her

14 cm. horizontal; the right 22.5 cm. vertical x 13 cm. horizontal.

The laboratory examination showed that the urine contained 3 plus pus and 2 plus blood and a heavy trace of albumin. The blood urea nitrogen was 30.1 mgs. per 100 c.c. of blood.

X-ray revealed bilateral calculi shadows in both kidney regions. The kidney shadows themselves were markedly enlarged, the left one being the larger of the two. The calculous shadow on the left seemed to be separated into two parts. Another lower shadow in this region suggested the possibility of the presence of a ureteral calculus in the left upper ureter. On the right side there was a small cluster of shadows overlying the lower pole of the kidney.

Cystoscopic examination was done on December 29, 1934. There was a fourth degree cystocele. Large areas of bullous edema were seen on the trigone and surrounding the location of both ureteral meati. Spurts of urine containing debris were seen to issue from this region on either side, but no indigocarmine was noted after intravenous injection from either side.

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## CASE REPORTS

A second ureteral meatus was searched for on the left side but none was found. After the insertion of a No. 6 ureter catheter on the right side a faint trace of indigocarmine was seen. Pale urine was collected from the catheter in the left ureter, but no dye was seen. Bilateral pyelograms were attempted. These showed the right renal pelvis to be completely filled by a lobulated calculus. The uretero-pelvic juncture was apparently not dilated. The small cluster of shadows over the lower pole was suggestive of gallstones by their arrangement although they may have been renal in origin. On the left side no shadow casting media could be introduced beyond a shadow which appears to be a calculus obstructing the ureter. One gathered the impression that there was a second ureter either branched or completely duplicated which was not catheterized or injected. No shadow casting media was introduced into the pelvis proper.

The renal tumors were visible when the patient was in the sitting position, but attempts to demonstrate these by photographic means were unsuccessful.

In view of the cachectic condition of the patient no surgical intervention was advised. She returned to her home and died one month later from what was reported as being uremia. An autopsy was not obtained.

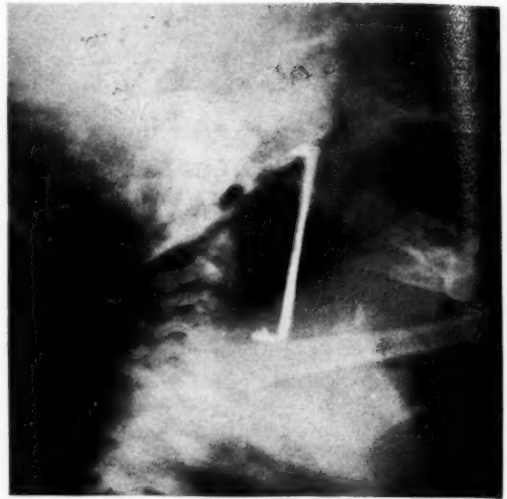


Fig. 1. The roentgenogram made in the lateral position showing situation of the foreign body in the nasopharynx and esophagus.

### AN UNUSUAL PHARYNGO-ESOPHAGEAL FOREIGN BODY AND ITS REMOVAL\*

HERMAN J. MOERSCH, M.D.

Rochester, Minnesota

The different foreign bodies that may become lodged in the esophagus are legion and are limited only by their inability to pass through the oral cavity. Nor are people immune to such accidents because of their sex or age. The comparative rarity with which foreign bodies become lodged in the esophagus, however, is a commentary on the marvelous workings of the deglutitive apparatus rather than of the human intellect. While most such accidents occur as the result of individual carelessness and improper mastication, they may be quite unavoidable. The following case is of special interest as it belongs to this latter group, and there was difficulty in extracting the foreign body.

#### Report of Case

A girl, four months of age, was brought to the clinic December 20, 1934, for the extraction of a foreign body which had become lodged in the pharynx and upper end of the esophagus. Several hours before, the patient had been lying in her crib happily watching her brother and sister disarticulate a metallic toy. Having completed their labors, the patient's mouth presented an inviting place for the disposal of one of the pieces of the toy, besides giving the baby a more personal interest in the proceedings. Inasmuch as this

article would not readily disappear, it was pushed back into the throat by manual means in spite of the associated screams and slight vomiting of blood-streaked mucus from the unfortunate recipient of these ministrations. The child was seen soon after by the home physician who ordered an immediate roentgenogram of the chest. This revealed the foreign body which had become lodged in the back of the pharynx and upper end of the esophagus. The patient was then referred to the clinic.

At examination on admission the child seemed comfortable and there were no unusual physical findings. Roentgenograms revealed that the piece of metal extended from the nasopharynx down into the upper portion of the esophagus (Fig. 1), and on laryngoscopic examination, it could be visualized in the midline of the pharynx. Because the hook on the upper end of this piece of metal was so firmly embedded in the posterior wall of the nasopharynx, it was impossible to extract it by direct traction without trauma. It was therefore first necessary to force the whole piece slightly upward and anteriorly into the nasopharynx to dislodge the sharp hooked upper end. When this was done it was then gently drawn downward into the esophagus until the upper prong or hook became exposed in the pharynx. As it was not possible to withdraw this rather long piece of metal from this position, and because of the danger of the lower angulated end tearing the esophagus, it was gently pushed down until it was almost completely in the esophagus. An esophagoscope was then introduced into the esophagus and around this foreign body, which could then readily be extracted within the protecting walls of the esophagoscope. The child made a rapid and uneventful recovery.

\*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota.

## EDITORIAL

### MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

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Foreign Subscriptions—\$3.50.

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BUSINESS MANAGER  
J. R. BRUCE, Saint Paul

Volume 18      MAY, 1935      Number 5

### Scarlet Fever Incidence

For the past seven years scarlet fever has been conspicuous in this territory by its comparative absence and mildness. A perusal of the Public Health reports shows that last year there was more scarlet fever in the southeastern states and this year the disease has shown epidemic form in Wisconsin, Illinois, Indiana, Iowa, and Minnesota. Some of the far western states also show a decided increase in the incidence of this disease. It is interesting, too, that measles, which attained epidemic proportions in the eastern and southeastern states last year, has been even more decidedly epidemic in character than scarlet fever this year throughout the middle and western states. Minnesota has had much more than its usual quota of mumps and German measles this year. Contagious diseases, like hard times, move in cycles. Whether scarlet fever tends to become more malignant in epidemic form remains to be seen.

Health departments are hard put to it when an epidemic of scarlet fever develops. The schools in Milwaukee were closed. Children under seven were prohibited from attending school in Minneapolis with the feeling that this measure would

tend to check contagion as more than 60 per cent of Minneapolis cases were among children under this age. Undoubtedly school association favors contagion even though the jump in incidence of contagious diseases following the opening of school each fall may in part be accounted for by readier detection of cases. Movies, however, afford almost as favorable a setting for contagion as schools.

The coincident prevalence of German measles is blamed for some of the spread of scarlet fever. Parents and even the attending physician too often have confused German measles and a mild attack of scarlet fever and have failed to report the mild infection.

The present epidemic has again raised the question of active scarlet fever immunization, the point on which the pediatricians and general practitioners seem to differ. Although Dick states that reactions occur in only 10 per cent of inoculations and are not harmful, these reactions are sufficient to prevent its widespread use. The naked vaccine now available is far from the last word in the problem of universal vaccination for the prevention of scarlet fever. The Dicks have been subject to severe criticism in their attitude toward further investigation in the refinement of their vaccine, made possible by patent rights. Any patent right which interferes with further research directed toward developing a scarlet fever toxoid free from the disadvantages of the present product savors of commercialism, is likely to postpone the development of a satisfactory vaccine, and is not in keeping with the spirit of the medical profession.

Doubtless in time scarlet fever vaccination will be developed so that universal vaccination will be universally recommended by members of the medical profession and epidemics of the disease will be no more.

### Lucretia Wilder Memorial

The tragic accident which resulted in the death of Miss Lucretia Wilder at the University of Minnesota Medical School in February has prompted a committee consisting of Dean Ford, Dean Scammon, Dean Lyon, Dr. Wangenstein

## EDITORIAL

and Professor Hal Downey to initiate the raising of a sum of money as a memorial to the name of this enthusiastic research student.

A graduate of West High School, Minneapolis, and the holder of a B.S. degree from the University of Minnesota, Miss Wilder was taking graduate work, majoring in hematology under Dr. Downey, when the accident occurred.

Working on a thesis involving leukocytosis in general, Miss Wilder had found that by injecting aleuronat into the pleural cavity of rabbits more leukocytes would appear in the pleural cavities of rabbits than were circulating in the blood at any one time. Strange to say, this experiment produced very little change in the blood picture. This led to a study of the bone marrow, the spleen, lymph nodes and liver, from the standpoint of the distribution of leukocytes in tissues and organs. It then became desirable to compare these results with those obtained by injecting organisms. A strain of staphylococci was obtained from the bacteriology department for this purpose.

Miss Wilder attempted to do one of these injections alone late in the evening of February 19, received a scratch, and some of the culture got into the wound. By the next morning she was extremely ill and showed evidence of septicemia. The course of the infection was so rapid that death occurred at noon, February 22.

Several hundred dollars have already been raised by the committee in charge, but it is hoped that the sum will exceed \$1,000. Whether the fund will be used for a scholarship prize or a memorial tablet will be determined later. Contributions of any size may be sent to Dean E. P. Lyon, 136 Medical Service Building, at the University of Minnesota, Minneapolis.

### Editor's Dilemma

An explanation seems in order so that the possibility of misunderstanding on the part of contributors may be obviated. For economic reasons the size of MINNESOTA MEDICINE was considerably reduced in 1934. This and a greater number of papers presented at our last State Medical Association meeting has resulted in a delay in publication of all papers submitted.

The publication of papers presented before the Minnesota Academy of Medicine and the Minneapolis Surgical Society has always produced a problem. Logically the paper presented before

either of these societies should be available in the same number in which the discussions are published in the Transactions. This necessitates the publication of the paper either in the Transactions or elsewhere in the same number of the journal. Both of these alternatives have been used in the past. The inclusion of such papers in the Transactions makes the Transactions bulky and although these papers are indexed in our yearly index, they do not appear in the Index Medicus. Therefore, some authors have expressed reluctance in having their papers so published. To deliberately publish one of these papers in the main body of the same issue is giving preference to articles presented before these two societies from the time standpoint and if there is one criticism the Editing and Publishing Committee and the Editor have tried consistently to avoid, it has been that of showing favoritism.

For the information of our contributors it may be stated that at the last meeting of the Editing and Publishing Committee the Editor was instructed to adhere as closely as possible to the publication of papers in the order of their presentation and submission for publication. This rule will be adhered to religiously and only slight modification necessitated in the make-up of any particular number of the journal or by delay in receiving papers will affect the regulation. Case reports will not be included in this rule.

A further enlargement of the journal would make prompt publication of papers possible. Doubtless as business conditions improve, the size of the journal will be gradually increased. Until such time the Editor begs the indulgence of contributors whose papers are being delayed in publication.

### Extension Courses

The Committee on Hospitals and Education of the State Association is looking for suggestions that will make more effective the post-graduate study program for physicians throughout the state. To this end it is suggested that those who have constructive criticism of courses communicate with the committee through the State headquarters. Especially is it desirable to know what subjects are of value to the greatest number and what method of presentation challenges attention. For instance, has diagnosis been emphasized at the expense of therapy? Is it the wish of members of the county societies to continue



## OF GENERAL INTEREST

courses in certain subjects in their communities or do they desire more concentration at the University? Your opinions if expressed will aid the committee in formulating recommendations.

C. A. MCKINLEY, M.D., *Chairman*  
Committee on Hospitals and Medical Education

## OF GENERAL INTEREST

Dr. Kenneth E. Stein, formerly of Prior Lake, has moved to Lakeville, Minnesota, where he opened offices April 1.

\* \* \*

Dr. Richard E. Scammon, Dean of Medical Sciences, University of Minnesota, addressed the Fellows and Staff of the Mayo Foundation at Rochester, Minnesota, April 25, on "Observations on the Social Aspects of Medicine in England."

\* \* \*

Dr. E. W. Johnson, graduate of the University of Minnesota, 1934, who has completed his internship at St. Mary's Hospital, Duluth, has opened offices at 4103 Chicago Avenue, Minneapolis, for the practice of general medicine.

\* \* \*

The St. Louis County Medical Society held a most noteworthy meeting April 11 in Duluth. The Iron Range contingent in St. Louis County organized about five years ago as a separate geographic unit within the parent County Society. This was to make possible local meetings of particular import to those men engaged in a like mining practice. It is interesting, however, that few units anywhere have held as many "extension courses and lecture series" as have these men. This has been in no way a defection from the St. Louis County. Once yearly the whole society meets in the golfing season at Eshquagama; again in December, the Duluth contingent holds a Pathological Conference *in extenso* at Eveleth. And now has been inaugurated a meeting at which the Range contingent brought to Duluth the entire April 11 program; and it was of extraordinary quality and merit.

Charles W. More of Eveleth gave at the above meeting a few pages out of his repertoire, and they were of fascinating interest. His medical experiences run an amazing gamut: drug-store Iowa apprenticeship; be-whiskered talented but highly septic teaching Chicago surgeons; through the dawning foggy atmospheres of Listerian antiseptics, the tearful typhoid days, when flies and cooks kept the closest associations in the drilling and construction period of the Missabe Range, when diphtheria meant death and a man's horse in summer and skates in winter carried where the gas station now blooms, where smallpox induced special police to shoot down an occasional stampeding lumberjack, and the "honky tonks" made merry, and—well, he has one of the joy seekers' skulls, with several foramina not catalogued in anatomies and strongly reminiscent of misplaced lead! Too few men have kept these mementoes; or have the faculties essential to recreate these scenes.

May, 1935

## REPORT OF THE COUNCIL ON PHYSICAL THERAPY

Physical therapy was in a chaotic condition at the time of the organization of the Council on Physical Therapy by the Board of Trustees in 1925. The chaos that existed was due to the activities of manufacturing agents who were selling apparatus directly to the physicians and to hospitals for "machine therapy." The profession was losing sight of the fact that true physical therapy consisted chiefly of intelligent hand work—namely, heat, massage and exercise—and that expensive machines and apparatus played a minor part in the realm of physical therapy so far as the majority of the profession was concerned. With the conditions confronting the newly formed Council, it can be readily understood that the first two or three years of the Council's existence were devoted to self education of its members; to formulating rules of procedure that could withstand criticism; and to months—even years—of study of certain physical phenomena used in physical therapy before it could refute or approve the therapeutic claims made by certain manufacturers. From a summary of the past work of the Council it can be stated that physical therapy is now in much better repute with the entire profession than it was at the time the Council was organized. Then justifiable skepticism was warranted by the misuse of physical therapy. Today patients are receiving more and more of that type of physical therapy that is of real value to them. There is still a great amount of work to be done and the Council will continue to guard zealously this field of physical therapy in order to prevent all irregular practices and to strive to enlarge its scope and usefulness for the benefit of the profession and the public at large. (*Jour. A. M. A.*, December 8, 1934, p. 1776.)

## VEGE MUCENE NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that workers at the Michael Reese Hospital have recently reported seventeen cases of proved gastric or duodenal ulcer relieved, symptomatically, following the administration of a mucilaginous plant substance (in contradistinction to gastric mucin) (*Illinois M. J.*, October, 1933). The material used in this work consists of powdered dehydrated okra, now marketed under the name of VegeMucene by BioVegetin Products Incorporated, which presented the product to the Council for consideration. The clinical studies made of the product, thus far, are so inadequate as to preclude any possibility of arriving at a fair estimate of the therapeutic value of the substance. The name is objectionable, as it implies that the substance is mucinous or mucoid in character, yet it is not a true mucin as the term is ordinarily employed; it resembles mucin in physical properties only. Notwithstanding the very limited studies thus far reported, the firm states in one of its advertising brochures that: "Extensive clinical tests have shown VegeMucene to be extremely effective in the treatment of patients suffering from peptic and duodenal ulcer." It is pointed out that these patients were maintained on a modified ulcer diet, which of itself undoubtedly would have effected a significant improvement in the majority of cases. The Council has been informed that the Board of Directors of BioVegetin Products, Inc., has taken formal action, endorsing lay promotion of VegeMucene. Thus the preparation has been thrust definitely into that vast realm of "ulcer cures" so elaborately exploited to the general public. The Council declared VegeMucene not accepted for New and Non-official Remedies, because it is an unoriginal preparation of powdered okra, marketed under a noninformative and misleading proprietary name, and promoted with exaggerated and unwarranted therapeutic claims to the profession and to the public. (*Jour. A. M. A.*, January 26, 1935, p. 316.)

# MEDICAL ECONOMICS

Edited by the Committee on Medical Economics  
of the  
Minnesota State Medical Association

B. J. Branton, M. D.  
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A. N. Collins, M. D.

## Questionnaire

From time to time a series of questions and answers has appeared in these columns. They are designed to assist the average busy physician to answer queries that are bound to be put to him these days on the reasons back of the stand taken by the House of Delegates of the American Medical Association against compulsory sickness insurance.

Questions and answers below are based upon research material from many sources. Notably, we are indebted this month to the Medical Society of the State of New York, also the pamphlet by Dr. Gustav Hartz, labor economist and former labor member of the Reichstag, of Berlin.

### It Won't Work

*Question:* Why are you opposed to compulsory sickness insurance?

*Answer:* Because *it won't work*.

The difference between sickness insurance in theory and sickness insurance in practice as seen after fifty years of experimentation in Germany, is the difference between what we would call in school a "stated problem," and an "encountered problem."

For instance, any physicist can draw a plan for a perpetual motion machine that will run forever, on paper. But when the plan is transformed into a working model, the machine stops. Why?

Because the picture on paper did not and could not adequately allow for friction and resultant loss of energy. But the friction was there, and it began to show itself as soon as the machine became an encountered instead of a stated problem.

It is possible to plan an ideal program for medical care for everybody, on paper, with the state or community paying the bill.

Anybody who complains about it puts himself in the position of appearing to be opposed to the best interests of society and the ideals of high-minded philanthropists.

Many of these plans have been made by people who had nothing else to do in life but visualize ideal conditions for the human race. Some of them appear to be professional millennium promoters.

But the doctor knows a good many things that the idealist who never treated a patient does not know.

### They're Paper Plans

What the doctor knows is really the most vital part of the problem, and the one that appears nowhere in the paper plans—the imperfections of human nature itself, which will surely operate to jam the machinery.

*Question:* How do you know that compulsory sickness insurance will not work? Granted that doctors know a good deal about human nature, they haven't put it to a test here in sickness insurance. Perhaps people are enlightened enough to make good use of such facilities.

*Answer:* People in America are not greatly different from people anywhere. In Germany today, medical policemen are required to determine whether people who are claiming sick insurance benefits are really ill, or whether they are taking a summer holiday at the expense of the insurance system.

### Half Were Well

Here are the results in examinations of 2,008 presumably sick patients who were examined recently by the medical policemen.

When the 2,008 were called for examinations before these newly constituted officials, they at once declared their complete recovery. Besides these, 289 were found to be well by these con-

fidential doctors. Thus nearly half of the 2,008 who had been claiming sickness benefits were not really ill at all.

In Germany, though health in general has considerably improved, the days lost from ill health have risen from an average of five and one-half days to twenty-eight days.

### Keeping Down Patients

On the other side of the picture, there is always the possibility that the doctor who is hired, not to diagnose illness, but primarily to keep down the number of patients, will dismiss many sick people as cured. Cases are not unknown where the confidential doctor has declared a patient recovered who nevertheless died a day or two later.

*Question:* Isn't it up to the doctors to make it a success? If the doctors are conscientious and well educated and careful, won't that take care of the friction caused by the rest?

*Answer:* Doctors who work in the treadmill created by general sickness insurance have no time for post-graduate study to keep abreast of new discoveries and ideas.

### Automaton Doctors

They become grinds, and, after a few years, degenerate into automatons, incapable of acute diagnosis and well-judged treatment. They cannot spare the time for skilled attention, and it is but natural that, in the end, they should lose any desire or faculty for it.

The enervating effect of this type of practice is demonstrated by the paucity of worthwhile research which has come from physicians working under compulsory insurance employment in Europe.

But even if the physicians could maintain a super-human acuteness and efficiency, the physician is only one participant in medical care.

It has been stated that 40 per cent of the people of the United States get no medical care whatever, but we are not told what proportion of this number would reject it if offered.

In America the poor are free to apply to the dispensaries, where they receive better care than the beneficiaries of compulsory sickness insurance in Europe. Quality can be maintained in these dispensaries because professional men of the highest standing, as well as the younger men, give their time to those in need.

The requirements of the American system are not for quantity primarily but for quality.

The American system is not perfect, assuredly, but it works. Better an imperfect plan that works than a perfect plan that fails!

## In Explanation of the California Situation

Information just received from officials of the California State Medical Association would indicate that they are confronted with an extremely difficult situation. For many years there has been a persistent, organized effort on the part of social workers, politicians, visionary uplifters and others of that ilk so widely prevalent in that sovereign state, to establish some form of compulsory health insurance. In recent years this movement has gained momentum, particularly as a result of economic conditions and the active aid and encouragement from a similar element having headquarters not far removed from Washington.

Although honest efforts were made by the conservative members of the California medical profession to stem the tide, they felt that further resistance was futile and that some form of compromise was necessary. In their emergency they thought that it was better to salvage what they could and retain some form of control. It occurs to the minds of many of us, however, that it might have been better to have gone down with the ship, maintaining the principles we know are correct, rather than compromise with those we know are wrong. It will be a severe test of the efficiency of the California State Medical Association if it can preserve order in the threatened chaos. It is possible that other states that are blessed with a more conservative public opinion, and particularly those that have a strong medical organization which has been able to influence legislative and public opinion, will be in a position to benefit by the experience of our colleagues in California. It is apparent that our western brethren have compromised with their eyes wide open. We hope they will be able to maintain control of the rudder of their storm-tossed ship, but we have our misgivings. We also hope that the good sense of the citizens of California will prevail and that they will soon realize the error of their way.

## May Day Campaign

The national program for the 1935 Child Health Day, annually set by the American Child Health Association for the first day of May, was neither vague nor visionary.

Immunization against diphtheria was the very definite and concrete objective. And it is to be hoped that the welfare and public health education groups that chose this objective for the 1935 May Day will not confine their propaganda to May.

Here is a program about which there can be no difference of opinion and no dissent.

Diphtheria can be controlled if every young child is immunized against the disease.

Every child should, therefore, be immunized, preferably by his family doctor and in the doctor's office. It should be done in the first year of life and certainly before the child mingles much with other children, since the highest death rate occurs in the first five years of life.

The Council of the Minnesota State Medical Association has left it to each individual county medical society to determine just what methods shall be used in each community for immunization of the children whom the individual doctor cannot reach through his private practice.

The Council is emphatic in its approval of the objective of all these campaigns to protect the young children from diphtheria.

Incidentally, a demonstration of the latest technique in diphtheria immunization, in smallpox vaccination and the administration of the Mantoux test will be sponsored by the Committee on Public Health Education of the association at the eighty-second annual meeting at the Minneapolis Auditorium June 24, 25 and 26. This is part of the association's program of practical assistance to the May Day campaign.

## More Government Hospitals

Within the last few days a flock of bills asking for increased hospital facilities for veterans has suddenly appeared in Congress.

These bills have been introduced by congressmen in some twenty-four different states. More than half the requests are for increased facilities for general medical and surgical cases. We have been informed, furthermore, that they were introduced at the request of the American Legion.

All this in spite of the fact that representatives of the American Medical Association were given the impression by prominent legionnaires in Chicago last year that the Legion program for this Congress called for no increase in hospitalization except for replacements or for necessary extra beds for neuro-psychiatric or tuberculosis cases or in communities where no hospital facilities are available.

Of especial interest to Minnesota physicians is the fact that one of these bills has been introduced by Congressman Theodore Christianson asking for a 200 bed addition for general medical and surgical cases at the Veterans' Hospital at Fort Snelling. This bill was introduced "by request." It asks for an expenditure of \$360,000 for the construction. "Such construction," according to the bill, "is to provide additional hospital, domiciliary and out-patient dispensary facilities for persons entitled to hospitalization or domiciliary care under *public laws and regulations*."

## For Federal Employees?

Clearly this addition could be used, under the provisions of this bill, to provide hospitalization for federal employees of any class.

There is no reason why it could not be available for all employees on Public Works projects who come under the federal compensation law.

In fact, it looks rather as if these hospitals were being requested to anticipate the increased load that may follow upon the new Public Works program or other federal relief programs employing persons who can be construed to be beneficiaries under the federal compensation law.

Employees on federal relief projects of any kind could undoubtedly be brought under this classification.

Certainly the medical profession should be much interested to know just what is contemplated. Both the Hennepin and Ramsey County Medical Societies have asked for information on the subject. Their course in the matter will be determined by what they find out.

It if should be a fact that hospitalization for all federal employees under the compensation bureau is contemplated then the medical profession should protest as promptly and as vigorously as possible.



## Individual Physician Must Help

In 1934 the House of Delegates of the American Medical Association authorized the Board of Trustees to proceed with a program of direct approach to the lay-public in discussion of sickness insurance.

The object was to find out just what people in general thought about sickness insurance.

Did they want it?

Were they dissatisfied with things as they are?

If so, just what changes did the common man think are necessary?

It seemed important to get an unbiased answer to these questions. Otherwise there was only the testimony of professional social workers and statistical studies of illness, amounts spent for medical care and costs of medical services.

The effort to get the reaction of the lay-public was put into the hands of the Committee on Legislative Activities, which, in turn, now makes an appeal to the individual physician.

A great deal has been done to get in touch with large lay groups in the interests of this program. Now it is time, in the opinion of Dr. R. L. Sensenich, South Bend, Indiana, in charge for the committee, for the physician to talk the matter over with his individual patients.

### Important to Patients

Says Dr. Sensenich:

"The interest and activity of the individual physician must be aroused to the degree that he will inform himself concerning sickness insurance, and present such information to the lay-public which he contacts. In this way he will aid greatly in crystallizing public opinion against harmful legislation.

"Reports to the Committee indicate that the individual citizen of influence, who has been misled by public statements that needed medical care is not available to those financially less fortunate, has, from radio talks, magazine articles, and other propaganda, come to believe that sickness insurance is desirable. Such a man can best be contacted through his personal friend, his physician. The best interests of the patient and the best interests of the physician are common, and it is not inconsistent with the ethical teaching of medicine for the physician to advise with him concerning sickness insurance. No special technic is needed in making individual lay-contacts. The physician is generally not without some ingenuity in matters of local interest. If he is opposed to some local project he does not hesitate to approach others in order to impress upon them the undesirable character of the pro-

posal or to enlist their assistance in defeating it. Certainly there could be nothing of more vital importance than the threatened measures. Effort must now be put forth to arouse the individual physician to interest in his own position and to his responsibility to others."

## "Medical Reporter"

Number 1, Volume 1, of *The Medical Reporter* appeared April 1 in the state of Oregon.

This little publication is issued, according to its title page, by the Committee of Publicity, Oregon State and Multnomah County Medical Societies. Presumably it will be issued monthly and its policy as announced on the cover is as follows:

"We have certain facts to present, facts that we consider important to all of the Medical Profession in Oregon.

\* \* \*

"We shall devote our attention solely to legislative, social and political problems confronting the profession.

\* \* \*

"We would not knowingly mis-say or misrepresent any matter nor misquote any individual. We are not concerned with opinions and shall refrain from expressing any of the same. Subject to limitations of space and our editorial judgment of the general character of the material presented, these columns are open to any doctor of the state who has a fact or facts to offer."

It is interesting to note that medical journals all over the country are now setting aside a section of each issue to be devoted to Medical Economics.

That they have been made available shows the growing interest of medical men, everywhere, in the social and economic problems of medicine.

## Chicago Storm Center

United Medical Service, Inc., long a storm center between factions of Chicago physicians and bitterly opposed by the Chicago Medical Society, has broken into the news again.

Dr. Joseph G. Berkowitz, president of the Service and one of the organizers, has been ousted by the board of directors and Dr. Charles R. Wiley, former vice president and also one of the organizers, has been put in his place.

The trouble was that one group believed the clinic should make a profit. The other didn't. Dr. Wiley heads the latter group, according to a story that appeared recently in the *Chicago Tribune*.

The entire clinic will be reorganized now, it appears, and will henceforth be operated as a not-for-profit institution, providing that Dr. Berkowitz is unable to carry out a threat to block the whole scheme. Dr. Berkowitz is said to own the majority of the stock in National Medicine, a Delaware holding corporation which, in turn, owns the United Medical Service. He threatens to call a stockholders meeting early in May.

One reason given by members of the staff of the clinic for opposition to Dr. Berkowitz was that he paid himself a salary of \$1,000 a month and also paid high salaries to his wife and Brig. Gen. James J. Ryan (retired), vice president and treasurer, who was also ousted. Other staff members worked long hours at salaries from \$150 to \$200 a month.

The history of United Medical Service, originally a philanthropic venture with backing of some of the great fortunes of Chicago, provides an illuminating commentary on one type of experiment with mass medical service by a corporation.

Obviously United Medical Service degenerated rapidly into a mere business for profit with an overworked, underpaid staff and it is easy to read between the lines that quality of the low priced medical service dispensed may have suffered.

### Sickness Insurance—Mr. Witte

Mr. Edwin E. Witte, Washington, D. C., executive secretary of the President's Committee on Economic Security, recently addressed a Round Table Conference of the Minneapolis Chamber of Commerce in Minneapolis.

Mr. Witte made a formal address in which he talked only about old age pensions, unemployment insurance and appropriations for maternity and infant care and for crippled children, the latter being a revival of earlier "Sheppard-Towner legislation," so-called, and an item of the program which he advocates strongly.

Not a word did Mr. Witte say about sickness insurance until a casual question was put to him after he sat down.

Then, instead of answering the question, he launched into a critical tirade against the American Medical Association for its reactionary attitude on this matter.

The President had been deluged with letters from physicians, Mr. Witte said, as soon as the program for a study of sickness insurance had been outlined.

The President was not planning to introduce sickness insurance, he said. He was simply planning to make a study. And he, Mr. Witte, was, personally, at a loss to understand why the American Medical Association should thus have opposed a mere study of sickness insurance.

He denied that the Secretary of Labor had ever made any statement to the effect that sickness insurance would actually be incorporated into this year's legislative program.

### A. M. A. First

When Mr. Witte was through his attention was called by one of the doctors present who has had considerable contact with the American Medical Association, to the fact that:

The American Medical Association itself had been the first group in the country to make a study of compulsory insurance;

The American Medical Association had always been keenly interested in anything that would improve medical care;

The Association is opposed to compulsory sickness insurance, not because physicians are reactionary, but because all controlled studies and all practical experience in Europe, the only place where the practical effects of sickness insurance can be studied, have convinced them that no form of such insurance will be practicable or applicable in this country;

The American people of all classes are getting better medical care than any other people in the world today;

### Health is Better

The health of the people is better than ever before, as morbidity figures will show, and, therefore, the American Medical Association can see no reason for rushing into untried schemes that may result in deterioration of standards of medical care;

From the standpoint of social security, alone, more depends upon the quality than upon the quantity of medical care.

Mr. Witte denied any connection with the Epstein bill (sickness insurance bill introduced into several state legislatures this year by the American Association for Social Security) though he

admitted that he is a member of the association of which Abraham Epstein, by whose name the bill is generally known, is executive secretary.

### Interested for Twenty Years

He said that he, himself, had been a proponent of social insurance for 20 years. He also said that California would surely pass laws providing for compulsory sickness insurance this year—and perhaps, on the other hand, they wouldn't.

It was evident, at any rate, from all his various statements that Mr. Witte is really heart and soul with the group that is so anxious to start some system of sickness insurance in America.

### Economics for Minnesota Physicians

A lecture course on Medical Economics and Business Management will be an important feature of the Eighty-second Annual Meeting of the Minnesota State Medical Association to be held at the Minneapolis Auditorium, June 24, 25 and 26.

This course will be given by Mr. Theodore Wiprud, executive secretary of the Milwaukee County Medical Society, with Dr. R. G. Leland, Chicago, director of the Bureau of Medical Economics of the American Medical Association, to discuss each lecture. The hours will be 9 a. m. to 11 a. m., each day of the meeting, and a special Auditorium lecture hall apart from the main assembly will be arranged.

The same course has been given with great success at Marquette University and a similar course is under contemplation as a requirement for senior medical students at the University of Minnesota. Any physician, any clinic or office manager for physicians will find the course of interest and value. It is especially designed for the information and guidance of young physicians.

### Medical Economics at Harvard

An interesting and significant short article on Medical Economics appeared in a recent *Harvard Alumni Medical Bulletin*.

It was written by Douglass V. Brown, Ph.D., Assistant Professor of Medical Economics, Harvard Medical School.

A footnote reveals the fact that Dr. Brown is the only man in the school working on this subject, since there is no department of Medical Economics. His professorship was created in September, 1933, and he gives his entire time

to study of all problems associated with Medical Economics.

These problems, in his opinion, include all of the economic aspects of the provision of Medical Service.

"Medical practitioners have rightly been preoccupied," he remarks in this article, "with the more technical aspects of medicine. As a result, the economic phases of medical services have been largely nobody's business."

### Many Problems

Among the economic phases that must be solved are those centering about the payment for medical service by various forms of insurance. Also the problems centering about the hospitals and the payment for hospitalization of the indigent.

The financing of public health activities has been given inadequate attention, too, and there is "that creature, god or devil, called 'State Medicine,' which has not even been satisfactorily defined, let alone analyzed from an economic point of view."

The following illuminating comments on these and other problems that are keeping Dr. Brown occupied are worth quoting here for those who do not often see the *Bulletin*.

### Health and Wealth

"What is the mutual relation and reaction between general economic conditions and the conditions for the provision of medical service? We have had dinned into us that 'a nation's health is a nation's wealth,' but we are more likely to overlook the equally important fact that the amount of the nation's wealth and the conditions under which it is produced and distributed will go far toward determining the nation's health. 'Adequate' medical care is relative not only to professional standards but also to economic alternatives. 'Adequate medical care' is ambiguous almost to the point of being meaningless once the economic implications are brought into the picture.

\* \* \*

"Another particularly knotty group of problems for the economist arises out of the unstandardized character of medical services. A bushel of wheat of a certain grade is a definite thing; even services of many kinds can be graded in terms of their results; but it may well be that the quality of medical service can never be known definitely, even to those who are engaged in providing it."

# Minnesota State Board of Medical Examiners

## St. Paul Chiropodist Pleads Guilty to Practicing Medicine Without a License

State of Minnesota vs. Peter Stolurow

On April 15, 1935, Peter Stolurow, forty years of age, entered a plea of guilty to an information charging him with the crime of practicing medicine without a license. Stolurow was sentenced by the Honorable Richard D. O'Brien, Judge of the District Court, to a term of one year in the St. Paul Workhouse. This sentence was suspended upon the following conditions: (1) That the defendant surrender to the Basic Science Board, for cancellation, his basic science certificate No. 129; (2) that he surrender to the Board of Chiropody Examiners, for cancellation, his chiropody license No. 82; (3) that defendant is to refrain from practicing healing in any way, shape or manner.

In April, 1928, Stolurow, who at that time had a license to practice chiropractic in the State of Minnesota, entered a plea of guilty to the crime of abortion, and was sentenced to a term of not to exceed four years in the State Prison at Stillwater. While the defendant was in prison his chiropractic license was revoked, but he retained possession of his basic science certificate and chiropody license. Upon his release from prison Stolurow opened an office in the City of St. Paul to practice chiropody. In March of this year information came to the St. Paul Police Department that Stolurow was greatly exceeding his chiropody license. On April 8, 1935, a complaint was filed charging him with practicing medicine without a license. On being arraigned in the Municipal Court he waived his preliminary hearing and his bail was set at \$1,000.

The Minnesota State Board of Medical Examiners protested to the Court that the defendant was using his basic science certificate and chiropody license as a shield to engage in the unlawful practice of healing. Judge O'Brien told the defendant that the only conditions upon which he would suspend the sentence were those enumerated above. Before sentence was imposed Stolurow produced his basic science certificate and chiropody license in court and they were turned over to the Basic Science Board and Chiropody Board, re-

spectively, for cancellation. The defendant will have no excuse whatsoever for again entering the field of healing in any of its branches.

## Medical Board Stops Unlicensed Technician at Windom, Minnesota

The Minnesota State Board of Medical Examiners conducted an investigation of the so-called Free Health Clinic that was advertised for Windom, Minnesota, on April 18, 19 and 20, 1935, and discovered that one of the individuals conducting the clinic was not licensed to practice healing in any state, but referred to himself as a "technician," claiming to be in the employ of Dr. Niblack's Clinic at Lincoln, Nebraska.

Dr. Wm. B. Covey, who stated he was of Luverne, Minnesota, in the advertisement, lives in the City of St. Paul. He is licensed as a chiropractor in the State of Minnesota, and planned on holding clinics at Luverne, Windom, Worthington, Jackson, St. James and Blue Earth, Minnesota, assisted by Dr. Neal L. Niblack of Lincoln, Nebraska. According to the hotel records at Luverne, Dr. Niblack was at Luverne for one day. Dr. Niblack is not licensed to practice in the State of Minnesota, and will not be permitted to do so. The technician gave his name as T. O. Medlin. He was operating an instrument which they referred to as a Hemodia-magnometer. They advertised that it was unnecessary for the patient "to remove any clothing or be asked one single question before the examination. After the examination is complete, you will be told just what and where your ailments are. One examination free to each family. Additional examinations will be charged for at the rate of \$5.00 each."

Dr. Niblack apparently returned to Lincoln, Nebraska, after spending one day at Luverne. Mr. Medlin was advised that he had no lawful right to practice healing in the State of Minnesota, and that if he continued to do so a complaint would be made to the proper authorities. Mr. Medlin immediately disconnected the machine and placed it in his automobile. He stated that he was leaving the following morning for Lincoln, Nebraska. In view of that fact that Dr. Covey holds a basic science certificate and a chiropractic license, he has a lawful right to practice chiropractic anywhere in the State of Minnesota.



## REPORTS AND ANNOUNCEMENTS OF SOCIETIES

### Medical Broadcast for May

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 10:30 o'clock every Tuesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

*Speaker:* William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month will be as follows:

- May 7—Hay Fever.
- May 14—Anemia in Children.
- May 21—Peptic Ulcer.
- May 28—The Sixth Year Molar.

### American Association for the Study of Goiter

The annual meeting of the American Society for the Study of Goiter will be held in Salt Lake City, Utah, June 24, 25 and 26, 1935.

Addresses by outstanding members of the medical profession from the East and West are announced in the preliminary program just received. In addition to addresses, dry clinics are scheduled.

Dr. Allan Graham of Cleveland is president of the Association and Dr. W. Blair Mosser of Kane, Pennsylvania, is corresponding secretary.

### American Urological Association

The officers of the American Urological Association and its Western Branch Society cordially invite all physicians of the Western Hemisphere interested in Urology to participate in the thirty-second national convention in San Francisco, June 24-28, 1935.

A splendid program has been arranged for the members and their families and headquarters will be in the world-famed Palace Hotel. Scientific sessions will be conducted June 25, 26 and 27 and the Western Branch Society will convene June 28. On Wednesday, June 26, Prof. Hugh Hampton Young of Johns Hopkins University, will deliver the Ramón Gutierrez Lecture on "The Abnormalities and Plastic Surgery of the Lower Genito-urinary Tract." Monday, June 24 has been set aside for the annual golf tournament which will take place on picturesque evergreen links overlooking the Pacific Ocean, followed by a stag dinner. A banquet will be held on the evening of June 26 and a dinner dance on June 27. Both functions will be graced by the presence of the fairer sex and their families.

Take advantage of the greatly reduced railroad rates and visit San Francisco whose historic background,

Bohemian atmosphere, cosmopolitan aspect and cool summer climate make it an ideal and interesting place to spend a summer vacation.

Dr. Charles P. Mathé, 450 Sutter Street, San Francisco, is chairman of the Publicity Committee.

### State Meeting

One of the highlights of the eighty-second annual meeting of the Minnesota State Medical Association to be held in the Minneapolis Auditorium, June 24, 25 and 26, will be a talk by Dr. Adolph Hanson of Fairbault. Dr. Hanson, because of recent contributions in the field of endocrinology, has the distinction of being the one exception to the policy of out-of-state speakers for this year's meeting.

He will show a film prepared by Dr. L. G. Rowntree and his associates of the Philadelphia Institute for Medical Research of the University of Pennsylvania, on the experimental use of rats of the extracts of the thymus and pineal glands, isolated by Dr. Hanson.

An exhibit of animals treated with the thymus extract will be outstanding among the many scientific demonstrations and exhibits planned for this year's meeting. The exhibit will be brought here by Arthur Steinberg of the Philadelphia Institute and besides other animals will include a pregnant white rat far enough advanced in gestation to yield a litter of precocious rats either during the meeting period or shortly before.

Experiments with Dr. Hanson's extracts by Dr. Rowntree and his associates received nation-wide newspaper comment in April, when full verification of the existence of the extract and its amazing effects on five generations of rats was reported by Dr. Rowntree. An exhibit, similar to the one which will be brought to Minnesota, attracted wide attention when shown at the Interstate Postgraduate Medical Association Meeting in Philadelphia last fall.

Two hours of program time each day will be devoted to these demonstrations, which, with the scientific exhibits, will number about fifty.

A feature of the meeting will be two joint sessions to be held with the American Association for the Advancement of Science, which will be meeting at the University during the same week.

Fifteen men, outstanding in various phases of medical work in the United States, are scheduled to appear on the program as principal speakers. Among these is Dr. Max Cutler, one of the foremost authorities on cancer in the country.

Dr. Cutler will be brought to Minneapolis by the Citizens' Aid Society and will give the annual Citizens' Aid Society Memorial lecture on cancer. His subject will be "Recent Advances in the Treatment of Cancer." He will speak on the Monday morning program.

Dr. Cutler is Consultant in Tumors at the Edward Hines, Jr., Veterans' Hospital, and director of the Tumor Clinic at the Michael Reese Hospital, Chicago.

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He is president of the American Society for the Study of Neoplastic Disease.

Also, on the Monday morning program will be a clinic to be conducted by University of Minnesota doctors. It is in connection with this clinic that Dr. Hanson will present his film and speak. A second clinic will be conducted Wednesday morning by doctors of the Mayo Clinic, Rochester. A medical court in which specialists in many fields will answer questions will be a part of Wednesday afternoon's program.

Another feature will be a course in medical economics and business management to be conducted by Theodore Wiprud, executive secretary of the Milwaukee County Medical Society. This is the same course which is offered at Marquette University. Dr. R. G. Leland, Chicago, Director of the Bureau of Medical Economics, American Medical Association, will discuss the lectures.

Dr. Leland will also talk Tuesday night at the meeting which will follow the annual dinner. Entertainment for the occasion is being arranged by the Hennepin County Medical Society. Featuring the entertainment program for the entire meeting will be a hobby show where medical men may see the diversions which occupy their fellow physicians' spare moments. Already a number of entries have been received, including musical scores, firearms, pipes, old books and others, which will be exhibited in a special room where treasures may be guarded.

### Minnesota Radiological Society

The winter meeting of the Minnesota Radiological Society was held in St. Paul, Minn., on March 16, 1935. The following program was presented:

1. Radiography of Sphenoid Sinuses Through the Open Mouth.....Edward Schons, M.D.  
St. Paul
2. Roentgenological Study of the Mastoid with Operative Findings in 230 Cases.....  
H. M. Berg, M.D.  
Bismarck, N. D.
3. Biliary Dyskinesia.....Herman Wolff, M.D.  
St. Paul
4. Comparative Value of Radium and Roentgen Therapy in Various Types of Malignancy...  
Charles Drake, M.D.  
Minneapolis
5. Roentgen Diagnostic Round Table
6. Disadvantages of X-ray Paper from the Physical Standpoint.....Alfred B. Greene, B.Sc.  
Oak Terrace, Minn.
7. Medical Economics in Relation to Radiology...  
Informal Discussion

The annual meeting of the Society will be held in Minneapolis in connection with the meeting of the Minnesota State Medical Association, June 24, 1935. At that time the Carman Lecture in Radiology will be given at the meeting of the Minnesota State Medical Association by Dr. Percy Brown of Boston. Dr.

Brown's subject will be, "Value of Fluoroscopy in Roentgen Diagnosis and Carman's Influence Upon It."

Sincerely yours,

LEO G. RIGLER, M.D.

### Minnesota Society of Internal Medicine

The spring meeting of the Minnesota Society of Internal Medicine will be held at the University, Saturday, May 18. Morning and afternoon sessions will be devoted to the presentation of scientific papers. Luncheon will be held at the Town and Country Club, Saint Paul, and dinner at the Club will be followed by the business meeting and an address by Dr. Percy Watson. Dr. Edwin L. Gardner is president of the Society, and the program has been arranged by Dr. Henry Ulrich.

### Minneapolis Surgical Society

The program of the Minneapolis Surgical Society to be held in the lounge of the Hennepin County Medical Society, Thursday, May 2, 1935, at 8:00 p. m., is as follows:

1. Dr. Charles E. Merkert (20 minutes)  
Inaugural Thesis: Tetanus.
  2. Dr. Carl O. Rice (15 minutes)  
Histo-pathological Study of the Tissues Following the Injection Treatment for Hernia.  
General Discussion of the Injection Treatment of Hernia.
  3. Dr. W. A. Hanson (15 minutes)  
Dr. L. Haynes Fowler.  
Tumors Simulating Carcinoma.
- A business meeting will be held at a six o'clock dinner preceding the scientific program.
- F. A. OLSON, M.D., *Secretary.*

### Nicollet - Le Sueur

The spring meeting of the Nicollet-Le Sueur Counties Medical Society was held, April 4, at the State Bank building, Le Sueur.

In accordance with a request from the State Public Relations Committee, Doctors M. E. Lenander, J. J. Kolars and P. J. Hiniker were appointed to act as a Public Relations Committee for the society.

On invitation, Doctors J. S. Holbrook and A. E. Sohmer of Mankato discussed the Blue Earth County plan for the care of the indigent, patterned after the Iowa plan. After discussion as to the advisability of changing Le Sueur County to the County Plan of care of the indigent, a committee of one member from each town was appointed to work with the county attorney and devise some method whereby care of the indigent can be handled more satisfactorily and expeditiously. If plans materialize, the committee intends to contact all township boards and place the matter before them.

Dr. F. P. Strathern presented a case of fracture of the fibula and astragalus. Dr. Holbrook showed x-ray

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of abdominal tumor that proved to be a pregnancy. Dr. M. C. Petersen gave the history and showed films of a case of slow bleeding due to nails, pins, et cetera, in the stomach. Dr. Strathern also reported on 2,400 Mantoux tests in Nicollet county, with 250 positive reactions.

The secretary read a communication about the annual state meeting, June 24, 25 and 26, urging members interested in the hobby show to get in touch with Dr. F. A. Olson, of Minneapolis. The message also stated that the meeting promises to be one of the very best, being held in conjunction with the American Association for the Advancement of Science.

### Northern Minnesota Medical Association

The Northern Minnesota Medical Association will meet in Duluth, August 12 and 13 this year. Drs. M. G. Gillespie, chairman of Program Committee, and F. H. Magney, chairman of local Arrangement Committees, are arranging for a fine scientific session and entertainment.

It is planned to hold the second day's session in the Lounge on one of the pleasure boats making a fifty-five mile trip up the North Shore of Lake Superior. The doctors are urged to plan early with their wives to take their vacation at this time and come to Duluth. Special entertainment is being arranged for the ladies on the same boat.

O. O. LARSEN, *Secretary.*

### American College of Surgeons North Central Section

The American College of Surgeons of the North Central Section, composed of Minnesota, Wisconsin, North Dakota, South Dakota and Manitoba had a two day conference March 15th and 16th and a Community Health meeting at the St. Paul Auditorium on the afternoon of March 17th. At the same time Hospital Executives of this area also met.

On Friday morning, March 15th, the conferences were broken up into three meetings. Out-of-town guests were speaking at twelve high schools and colleges on health matters while surgeons gathered at surgical and medical clinics in the local hospitals and at the same time a hospital conference was being conducted at the Lowry Hotel under the direction of Dr. Herman Fritschel, Superintendent of the Milwaukee Hospital.

Of the hospital clinics, the Cancer Clinic conducted at St. Joseph's Hospital, the Fracture Clinic at Ancker Hospital and the Neurological Clinic held at Mounds Park Hospital were of special interest to the visiting doctors.

The Hospital conference for hospital executives, trustees and others interested in hospital work was held in the Lowry Hotel, Friday, March 15th, and attracted a large number of visitors. Dr. MacEachern, Associate Director of the American College of Surgeons and Director of Hospital Activities emphasized the standards required by the American College of

Surgeons and that these standards must be provided in any hospital that desires to render good service to patients and that many of the detail problems arising in addition to these standards must be solved by each individual hospital. Mr. Paul Fesler, Superintendent of the Wesley Memorial Hospital of Chicago, in speaking of the trends in hospital administration, stated that all hospitals must be aware of the economical trends now affecting hospitals and in spite of the necessary reductions of expenditures, we must not endanger the care of patients. Hospitals are now meeting a rising market; hospitals must be paid or the service provided patients will suffer. They must be subsidized by the government or through group hospitalization or through some insurance method.

A luncheon was given by the St. Paul Association at the St. Paul Hotel, where 300 business and industrial workers heard Dr. Besley speak on the subject "Preservation of Health in Industry." Dr. Robert Jolly spoke on "Hospitals, Doctors and Disease." Dr. F. Besley stated that accidents and illness "can be reduced materially by establishment of properly organized medical departments to care for the human machinery, the same as engineering departments look after the inanimate machinery in all large and small industries. The medical department should be given complete control of the health and welfare of workers in each industry. It should be responsible only to the president of the company and his board of directors and should not be dictated to by the personnel man or the foreman. This same principle should apply to insurance companies which are assuming risks under workman's compensation laws."

A business meeting was held Friday night by the American College of Surgeons and the following officers were elected. Dr. Cole was re-elected Chairman of the state executive committee of the College and Dr. James M. Hayes, Minneapolis and Dr. O. J. Hagen, Morehead, were re-elected secretary and counselor, respectively. Other executive committees names were: Wisconsin, Dr. F. Gregory McConnell, Oshkosh, chairman; Dr. Wm. J. Carson, Milwaukee, secretary; and Dr. Thomas J. O'Leary, Superior, counselor: North Dakota, Dr. Murdock MacGregor, Grand Forks, chairman; Dr. John H. Moore, Grand Forks, secretary and Dr. John E. Countryman, Grafton, counselor: South Dakota, Dr. E. A. Pittenger, Aberdeen, chairman; Dr. F. Daniels Gillis, Mitchell, secretary and Dr. Wm. G. Magee, Watertown: Manitoba, Dr. B. J. Brandon, Winnipeg, chairman; Dr. George W. Fletcher, Winnipeg, secretary and Dr. W. A. Bigelow, Brandon, counselor.

The community health meeting held Sunday afternoon was received with enthusiasm and support by the citizens of the community. The theatre auditorium was completely filled which necessitated an overflow meeting in the adjacent stage auditorium. The meeting opened with addresses of welcome by Mayor Gehan, John P. Devaney, chief justice of the State Supreme court and Dr. Robert B. J. Schoch, city health officer. Addresses included discussions of cancer, appendicitis, backache, nervousness and operation of hos-

## WOMAN'S AUXILIARY

pitals. Speakers were Dr. Leroy Long, Oklahoma City, Dr. Irvin Abel, Louisville, Dr. M. T. MacEachern, Chicago, Dr. F. A. Besley, Waukegan, Illinois, Dr. Phillip H. Kreuscher, Chicago, Dr. Alfred W. Adson, Rochester, and Robert Jolly, Houston, Texas.

Dr. Irvin Abel, professor of clinical surgery at the University of Louisville, Kentucky, said, "Cancer can be cured but it must be treated early." He urged the delegates to join in a militant mass attack on the disease. He said, "Experience has shown two of the most important phases of the cancer problem involve the time element. In other words, early recognition and the application of appropriate treatment. It is estimated that from 70 to 90 per cent of cures are now obtained where small, localized malignant growths are accorded prompt and efficient treatment, while in but 10 to 15 per cent are such results obtained in late cases throughout the body. The three factors which in the light of our present knowledge appear vital to its accomplishment are cancer education, cancer treatment and cancer research. Every hospital can and does supply treatment. Every hospital can and should participate in the clinical aspect of cancer research. Every hospital and its staff should take part in the program of cancer education to bring forcibly to the attention of the profession and the public the facts that cancer is curable when recognized early and treated by established, time-tested methods."

Dr. Newquist of Chicago said, "It is the job of industrial medicine to prevent accidents and illness among workers and its vigilance extends to prevention of occupational diseases, such as silicosis and lead poisoning, which might result from the conditions to which a worker is exposed unless properly protected. Eight hundred agents used in manufacturing processes are toxic or are so closely related to know toxic agents that poisoning might be expected unless guarded against. Those toxic agents change from year to year as manufacturing changes and industrial physicians must be constantly on the alert to set up safeguards. Industrial medicine is becoming more of a specialty every day because of industry's demands for adequate medical service. The demand was brought about by these conditions—more rigid application and extensive coverage of workmen's compensation laws, the increasing complexity of manufacturing processes with attendant occupational disease hazards, and the presence of contagious and infectious diseases. The objectives of industrial medicine are to determine by examination the mental and physical fitness of a man for work, to maintain the health and efficiency of those already employed, to educate the worker in accident prevention and personal hygiene and to reduce absenteeism. Injuries, illness, time-loss and relating expense cost industry approximately 600 million dollars in 1934. Injuries increased 14 per cent and time loss 37 per cent over 1933. This was caused partly by hiring of new employees and by the return of old employees after a long layoff and partly by the disorganization of safety and medical services in plants during their period of idleness. Employers are recognizing that preservation of their employees' health is good business and also

are realizing that if a man becomes too slow or unsuited for one job, he may fit very well into another and need not be discharged. Industrial medicine, by examining a man, can place him in the job which he can best fill."

On the cheerier side, Dr. MacEachern predicted that the present generation will have a longer span of life. "Medical education," he said, "has progressed far beyond the point of talk about fresh air and tooth brushes. That is familiar routine now, and because of it, the growing health consciousness of high school children of today will aid these children in living longer than their parents. The human life line in America has been extended from the age of 40 to the age of 59 or 60 in the past 40 years. Medical science, as yet, has learned comparatively little of the cause of cancer, which is responsible annually for 92 deaths among every 100,000 persons in America. Cancer is public health enemy No. 2. Heart disease, which kills annually 214 persons in every 100,000 is the most prevalent cause of death today. Others in the order of their gravity are kidney complications, pneumonia, diseases of the arteries and high blood pressure and tuberculosis. Cancer can be cured if early recognition is followed by surgery, x-ray or radium treatment." He cited 26,000 cured cases of cancer.

## WOMAN'S AUXILIARY

President—Mrs. MARTIN NORDLAND, Minneapolis

Editor—Mrs. C. F. EWING, Wheaton

### West Central Minnesota

Members of the West Central Auxiliary met with their husbands for dinner in the evening at Morris, Minnesota, April 17. Among other business, Mrs. Otto Bergen was named chairman of Public Relations of our District. There were nine members present. We feel that if every district in the county were organized it would promote a wonderful feeling between doctors and their wives everywhere.

\* \* \*

### St. Louis County

Mrs. T. O. Young, Duluth, opened her home for a one o'clock luncheon Tuesday, April 16, to members of the Women's Auxiliary to the St. Louis County Medical Society. Assisting hostesses were Mrs. P. F. Eckman, Mrs. P. G. Boman, Mrs. K. R. Fawcett and Mrs. L. R. Gowan.

\* \* \*

### Swift-Meeker-Kandiyohi Counties

The Medical Auxiliary of Swift, Meeker, and Kandiyohi Counties met at Willmar, April 17, having dinner with their husbands and a social evening following. On April 25 there was a meeting of the Auxiliary at Benson at which members were present from Swift, Meeker, Kandiyohi Counties and West Central Minnesota.



# TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

STATED MEETING HELD MARCH 7, 1935

The President, DR. MARTIN NORDLAND, in the Chair

## DIVERTICULOSIS AND DIVERTICULITIS OF THE COLON

### Inaugural Thesis

William R. Jones, M.D.

Diverticula of the bowel are outpouchings or sacculations from the bowel. They are of two types: congenital or true, and acquired or false. The congenital type contains all the coats of the bowel; Meckel's diverticulum is an example. This type usually occurs in the small intestine. The acquired type is practically always false; it is a hernial protrusion of mucosa through the muscle layer of the bowel. The pouch contains only two coats—mucosa and serosa. This type occurs most frequently in the colon. In the early stages of formation, diverticula may contain muscle as well as mucosa and serosa; however, the muscle layer soon thins out and disappears (Fig 5).

**History.**—Diverticula were probably first described by Crevehier,<sup>8</sup> in 1849. They were again described by Virchow,<sup>20</sup> in 1853, at which time he described the state of peridiverticulitis. In 1898, Graser<sup>21</sup> showed that diverticulitis was not such an uncommon condition and that it was of great importance. Wilson, Mayo and Giffin,<sup>22</sup> in 1907 reported five cases of diverticulitis of the sigmoid colon in which resection was done. Since this time many contributions to the literature have been made. Telling and Gruner,<sup>23</sup> Spriggs and Marxer,<sup>24</sup> Judd and Pollock,<sup>25</sup> Sistrunk,<sup>26</sup> Erdmann,<sup>27</sup> Rankin and Brown,<sup>28</sup> Mayo,<sup>21</sup> Lockhart-Mummery,<sup>29</sup> and many others have written on the subject. Probably the most comprehensive description was given by Telling and Gruner,<sup>23</sup> in 1916.

**Distribution.**—Diverticula of the colon occur along the entire course of the bowel. They have been found in the appendix and the rectum. They are found in the colon with increasing frequency from right to left. The maximum number occur in the sigmoid flexure, and it is at this site that they most frequently become inflamed, giving rise to the condition called diverticulitis. The pouches are found on the antimesenteric and lateral walls of the colon and not on the mesenteric wall.

**Age Incidence.**—Diverticula of the colon usually are found after the age of forty. An occasional case has been reported under this age. Erdmann<sup>27</sup> reports one in a child of seven, but, even so, the disease is relatively rare in children.

**Etiology.**—The cause of diverticula of the colon or diverticulosis is a disputed question. Several theories as to their origin include: (1) obesity; (2) constipation; (3) bowel wall weakness; (4) increased intracolonic pressure; (5) blood vessel openings in the bowel wall; and (6) infection. Bowel wall weakness and increased

intracolonic pressure are probably the immediate causes. The sigmoid colon is the usual site of diverticulitis. It is at this point that feces become more stagnant and less fluid. Considerable amounts of gas form at this point, causing an increased amount of pressure in the sigmoid. It seems reasonable that any factor, such as constipation, which raises the pressure within the sigmoid, would contribute to the pushing out of mucosal herniae. Judd and Pollock<sup>25</sup> report that 63 per cent of their patients were constipated. On the other hand, constipation is more frequent in women than in men, and diverticulitis is more frequent in males than in females. Telling<sup>23</sup> states that it is quite common for large amounts of gas to collect in the male sigmoid, and that this is an important factor in the formation of diverticula in this region.

It has been noted by many investigators that bowel wall weakness is important in the formation of diverticula. The condition of diverticulosis is usually found in individuals over forty years of age who are obese and who lead sedentary lives. The bowel wall in this type of individual becomes weaker after the age of forty. Diverticula occur more frequently in fat-laden gut than in that which possesses less fat. Fat infiltrates between muscle fibers, causing a weakness of the muscle layer of the bowel wall, thus inviting pouch formations when the intrasigmoid pressure is increased. Diverticula are frequently found invading the appendices epiploicae; this is another reason for the fat theory of origin (Figs. 1, 2, and 4).

Diverticulosis is found in individuals who are not necessarily obese, though many of these have lost weight and much fat has disappeared from the bowel wall. Frequently a hernia will occur at the weakened point. This point has been found experimentally on the cadaver to be on the mesenteric border. This finding was probably the basis for the theory that vascular orifices caused weakness on the mesenteric side. When a living colon is distended, it ruptures on the antimesenteric border. This has been proved in the laboratory on a dog, and the same observation has been made on a man after an air hose had been accidentally applied at the anus. Most of the evidence in false diverticula formation points to weakened muscle in the bowel wall and increased intracolonic pressure. One might compare a colon with multiple diverticula to an old weak automobile inner tube that has lost much of its tonicity.

**Pathology.**—Diverticulosis per se is innocuous unless infection occurs. Infection results in inflammation of one or more of these pouches. Diverticula of the colon may be single or multiple; a single diverticulum is rare. Diverticula vary in size from a microscopic pouch to the size of a plum seed. They begin as small pouches. Subsequently, the mucosa may grad-

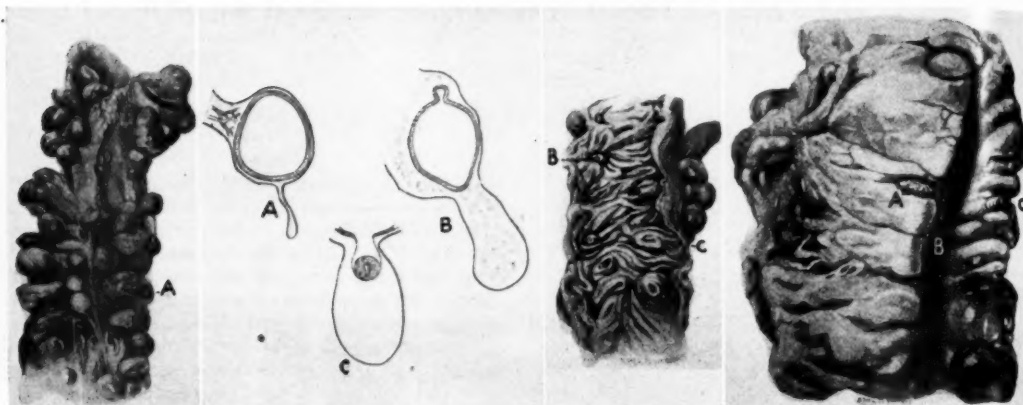


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 1. Diverticula of the sigmoid. The fat has been dissected from the outer aspect of the bowel. The pouches are for the most part in the appendices epiploicae. (A) A sac which has been laid open. (From Telling and Gruner.)

Fig. 2. The manner in which richness of the appendices epiploicae in fat predisposes to diverticulum formation. (A) Diagram of a transverse section of the colon from a thin individual, to show the relation of the epiploic appendix to the subserous fat. (B) Diagram of a transverse section of the colon from a very obese male, aged fifty-five, to show the disposition of the subserous fat, and its relationship to the epiploic appendage. A diverticulum is in the process of formation. (C) Diagram showing a diverticulum pouching into the epiploic appendage, and containing a fecal concretion, in the interior of which is a foreign body. (From Telling and Gruner, after Bland-Sutton.)

Fig. 3. Inner surface of the bowel of specimen shown in Figure 1. (B) Concretion presenting at orifice of one of the diverticula. (C) Lipped orifice of a diverticulum. (After Telling and Gruner.)

Fig. 4. Diverticula of the sigmoid, showing enteroliths. The abundant fat has been dissected from one half of the bowel, showing pouches which entered the appendices epiploicae. (A) A single pouch which has been dissected out, showing well how they are buried in fat, and liable to pass unrecognized unless especially sought for. (B) Longitudinal band. (C) Concretion. (After Telling and Gruner.)

usually push its way through the muscle layer of the bowel wall, the muscle thinning in front of the evagination. Finally, a bottle-shaped pouch is formed, the bottle neck being at the mouth of the sac. The wall of a diverticulum is composed of mucosa and serosa. No inflammation is present in the state of diverticulosis. This mode of formation shows that these pouches are due to bowel wall weakness and increased intracolonic pressure rather than to primary infection, as stated by Spriggs and Marxer.<sup>27</sup> These investigators believe that before any pouch forms there has been some infective process in the muscle layer of the gut wall, causing it to be weakened. They believe that the infective process is due to an abscessed tooth or other focal infection.

In a diverticulum in the sigmoid, fecal material which has lost much of its fluid content and has become pasty may collect in the pouch. This material may become dried and hard, possibly becoming a fecal stone. The stone may irritate the lining of a diverticulum and at times may tend to erode the sac wall. At times stones of this nature will project into the bowel lumen. When this occurs the stone is in contact with the normal moving fecal mass. The result of peristaltic action on this mass may cause sudden perforation. (Note thin-walled sacs—Figs. 3 and 5.)

Frequently trouble is caused by mechanical irritation with infection. The bottle-shaped pouch is often poorly drained, and when, from irritation, edema of the sac occurs, the diverticulum may be incompletely drained or not drained at all. This part of the bowel is rich in bacteria, making conditions ideal for infection. Inflammation of varying degrees may, therefore, occur.

This inflammation may simulate appendicitis, except that it is on the left side of the abdomen. The condition may be of mild degree and may subside; or it may progress and cause a general peritonitis, or a local abscess or a fistula, or peridiverticular adhesions. Bacterial toxins or bacteria may pass through a thin-walled pouch without actual perforation and cause a general peritonitis; or these bacterial toxins and bacteria may set up a chronic proliferative inflammation in and about the bowel wall. This latter condition is known as peridiverticulitis (Figs. 6 and 7).

At times a large amount of fibrous tissue is formed, causing the bowel wall to be as much as two inches thick. This fibrous tissue may contract and become hard, even becoming cartilaginous. When contraction takes place, stenosis of the bowel may result. At the time proliferation takes place, ulceration of the sac wall may occur. This may lead to perforation and multiple abscess formation. Because of protective adhesions, rupture into the general peritoneal cavity usually does not occur. Such abscesses stimulate more fibrous tissue formation, thus causing the mass to become harder and larger. It is not surprising that this condition has been confused with carcinoma. When a mass of this kind is resected, it should be examined thoroughly, both grossly and microscopically, for carcinoma. A diverticulum may perforate suddenly as described above, because of erosion by a fecolith. However, due to the chronic nature of the inflammatory process, the weakened sac wall is usually protected by adhesions and only a local abscess forms.

An abscess usually causes pain, fever, and a leukocytosis. It may drain by spontaneous rupture into a



Fig. 5



Fig. 6

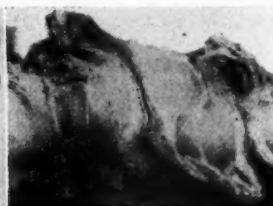


Fig. 7



Fig. 8

Fig. 5. Microscopic section through a diverticulum, to show the muscularis terminating suddenly at the neck of the sac. The other coats are much attenuated. (From Telling and Gruner, after Hartwell and Cecil.)

Fig. 6. Peridiverticulitis, with great thickening of the gut wall, causing stenosis and simulating carcinoma, for which it was mistaken when resected. (A) Thickening, due to fibrosis. (After Telling and Gruner.)

Fig. 7. Great peridiverticular thickening with high grade stenosis, and elongated and tortuous diverticulum is well seen. (From Telling and Gruner, after W. J. Mayo.)

Fig. 8. Diagram of the brim of the pelvis, to show an adhesion between the sigmoid and the pelvic floor, dragging the bowel down and allowing the production of a kink. A portion of the cecum and appendix is seen at the left. (From Telling and Gruner, after Pennington.)

neighboring viscus, such as the bladder or small intestine, tube or ovary, or it may rupture externally. Occasionally a diverticulum may rupture into a hernial sac. When such a rupture occurs, a fistulous tract is formed between the bowel and whatever viscus it invades. A diverticular mass may become adherent to an adjoining organ without fistulous formation resulting. Adhesions to small intestine may cause intestinal obstruction; those to the bladder may give rise to frequent and painful micturition. Adhesions usually interfere with free movement of the sigmoid and may cause angulation or kinking of this part of the colon (Fig. 8). Volvulus may result from this kinking. Metastatic abscesses to the liver may result.

Diverticulitis has been said to be a predisposing cause of carcinoma, the chronic nature of diverticulitis, with irritation over a long period of time, being blamed. Judd and Pollock<sup>10</sup> report a series of 137 cases of diverticulitis with operation. In 118 of these cases there was no evidence of malignancy. Carcinoma was found in nineteen cases associated with diverticulitis. They state that in many cases there seemed to be no relation between the two conditions, and that in some of these cases there were only two or three diverticula present, and that these were remote from the carcinoma. Their conclusion is that a patient with diverticulitis is no more apt to develop malignancy than a patient without it.

**Symptoms.**—The presence of diverticula or diverticulosis does not give rise to any symptoms. It is only when one or more pouches become inflamed or perforation occurs that symptoms appear. In the mild type of diverticulitis the patient usually complains of some discomfort about the umbilicus or in the left lower abdomen. There is some flatulence, and nausea may be present. There is usually tenderness to palpation over the affected area, with slight muscle rigidity. Constipation is usually present although it may alternate with diarrhea.

In the more severe cases of inflammation the symptoms are aggravated. They increase in severity in proportion to the degree of pathological changes present. Varying degrees of obstruction are present where the bowel lumen is encroached upon. Complete obstruction may develop. If perforation occurs without wall-

ing off, the symptoms of general peritonitis are present. If an abscess ruptures into an adjoining pelvic viscus, symptoms referable to that organ make themselves evident. If a loop of small intestine becomes adherent to the diverticular mass, intestinal obstruction may develop. If an entero-colic fistula develops, the contents of the small intestine are passed from the rectum. When the mass adheres to the bladder, frequent and painful micturition may follow. If a fistula occurs between the mass and the bladder, gas, feces, pus and blood are passed from the urethra. Frequency and burning on urination usually occur also. Blood may be present in the stool, although this is not common unless there is an associated carcinoma.

**Diagnosis.**—When a patient presents himself for study giving a history of lower abdominal pain or discomfort, especially on the left side, with flatulence and irregularity of the bowels, diverticulitis should be kept in mind. As diverticulosis causes no symptoms, it can only be diagnosed by x-ray examination of the colon, either by barium enema or a barium meal. In many cases the diverticula can be seen filled with barium when the enema is retained (Fig. 9). In others, the column of barium obscures the pockets, especially if there are only a few present. In such a case, diverticula may be demonstrated after the bowel is emptied (Fig. 10), the sacs retaining some of the shadow-casting media. Many cases of diverticulosis are found in a routine examination of the bowel. Rankin and Brown<sup>11</sup> report that 5 per cent of all cases subjected to colon x-ray study in a five year period at The Mayo Clinic showed diverticula, and that diverticula were found in 5 per cent of autopsies performed during this period. D. F. Jones<sup>12</sup> states that 12 to 15 per cent of cases of diverticulosis will develop diverticulitis. X-ray study of a case of diverticulitis will usually show the barium-filled pockets and also a spastic area at the inflammatory site (Fig. 11). This area gives the appearance of spikes or a fir cone appearance described by Spriggs and Marxer<sup>4</sup> and by Sir Gordon Watson<sup>13</sup> (Figs. 11 and 12). X-ray examination is probably the most reliable single means of diagnosis.

Sigmoidoscopic examination may be of value. At times the openings into the sigmoid can be seen. Usually, however, these openings are too high and cannot

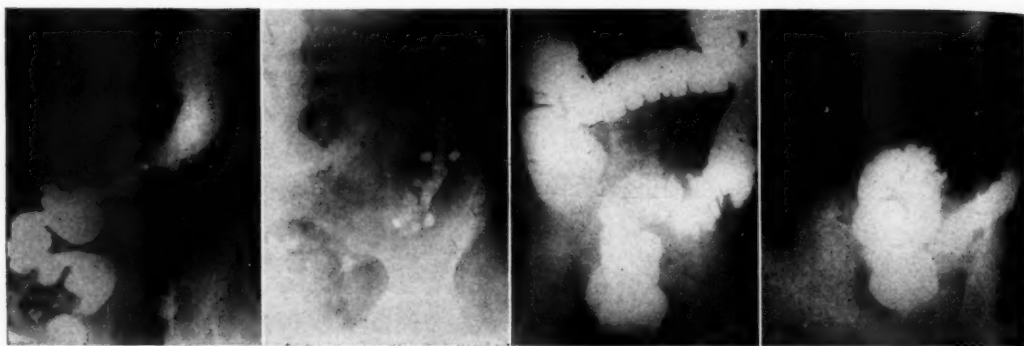


Fig. 9

Fig. 10

Fig. 11

Fig. 12

Fig. 9. X-ray showing multiple diverticula filled with barium, and narrowing of the colon.

Fig. 10. X-ray after evacuation of barium enema, showing retention of the opaque media in diverticula.

Fig. 11. X-ray of colon, showing diverticula and spiked appearance, due to inflammation.

Fig. 12. X-ray of colon, showing inflammatory area in sigmoid.

be reached by the sigmoidoscope. This investigation should be done carefully and gently as it is dangerous in the presence of acute inflammation.

When a vesico-colic fistula is present, cystoscopic examination may be of value. Usually the actual mouth of the fistula cannot be seen but an inflammatory area can be found on the bladder wall. When this fistula is present, methylene blue injected in the rectum will appear in the urine. In many cases a mass in the lower left quadrant of the abdomen can be palpated. Not uncommonly a history of intermittency is obtained, the patient at times being free, or relatively free, from symptoms, and at intervals suffering severely. There is usually not much weight loss. This is not the history of carcinoma, which is progressive and continuous, and which usually results in more weight loss.

Frequently x-ray can differentiate between these conditions. At times they can only be differentiated by microscopic examination of the resected tumor. Blood in the stools occurs more frequently in carcinoma than in diverticulitis. This is true because in carcinoma ulceration of the mucosa of the bowel usually occurs and in diverticulitis seldom does. When gas and feces are passed from the urethra, the diagnosis of a vesico-colic fistula is certain. When the contents of the small intestine come from the rectum, an entero-colic fistula is present.

**Prognosis:** Hunt<sup>11</sup> states that the finding of symptomless diverticula of the colon by x-ray examination is of no more significance than the similar visualization of a symptomless appendix or gallbladder. This is not entirely correct because a colon in which diverticula are present is a colon with a weakened wall. Furthermore, diverticula are usually multiple, while the appendix or gallbladder is a single structure. If inflammation develops in a diverticulum, the condition is more serious than appendicitis. The appendix can be removed with little risk, while operation for diverticulitis is of a major type and involves greater risk, according to Daniel Jones<sup>12</sup> carrying a mortality of 12 to 22 per cent. If the patient follows the instructions of a competent physician, the prognosis should be good.

The cases of fistula and abscess are serious and require careful surgical management. Perforation with general peritonitis is serious and carries a high mortality.

**Treatment.**—A case of diverticulosis should be under the management of a physician. Attention should be given to general body health. Any focus of infection which tends to lower the patient's resistance should be removed. Moderate exercise, regular habits and rest should be encouraged, and overweight discouraged. A simple smooth diet such as prescribed by Bargen and Victor<sup>3</sup> should be followed. Constipation is to be avoided. As this condition has a tendency to progress, the colon should be x-rayed once a year.

A patient with low grade diverticulitis should be put to bed. To rest the bowel, morphine and atropine should be given. Hot packs applied to the abdomen seem to give some relief. Hot rectal irrigations at low pressure with normal saline are of value. A liquid or soft diet is the only food that should be allowed. Usually with this type of treatment a mildly acute attack will subside. After the acute symptoms have disappeared, the patient may be treated as a case of diverticulosis; in addition, mineral oil should be given orally in one to two dram doses two or three times a day as necessary in order that a soft, but not a liquid, stool results. Warm oil enemas at weekly intervals are of value. Hot rectal irrigations of normal saline two or three times a week should be kept up for weeks or months according to the response in each individual case. X-rays of the colon should be taken at six month intervals. The patient should be warned of the danger of obstruction in order that he may report any early obstructive symptoms that may arise. With this type of management even moderately severe cases may go for long periods of time or for life without need of operation. Spriggs and Marxer<sup>4</sup> report a series of twenty-five cases treated medically; of these, sixteen were greatly benefited, eight were much improved, and one received no relief.

**Surgical Treatment.**—Erdmann<sup>13</sup> believes that as soon as the diagnosis is made all acute cases should be operated upon. He states that there is no more reason



to wait or try medical treatment than there is in acute appendicitis or acute tubal infection. This seems to be unnecessarily radical, especially when we consider the magnitude of most surgical procedures on the colon.

Cases which require operation may be divided into the following five groups: (1) acute cases which do not subside when treated medically; (2) acute perforation; (3) abscess formation; (4) chronic inflammatory cases with fistula or obstruction; (5) malignancy.

1. The acute inflammatory symptoms may not subside in any given patient, even with the best conservative care. Pain may increase and the temperature continue to rise. The leukocyte count may increase and the general condition of the patient becomes worse. All of these signs point to a progressive pathological process. Such a case is best treated by bowel drainage proximal to the affected area, either a colostomy in the transverse colon or appendicostomy or cecostomy. Probably a cecostomy is best.

2. An acute perforation must be explored, the opening in the bowel closed and the abdomen drained.

3. In a case presenting a demonstrable abscess, the abscess should be drained extraperitoneally if possible.

4. Cases showing chronic inflammation with obstruction have been treated in many ways. When angulation or kinks are caused by adhesions, Lockhart-Mummery<sup>8</sup> advises the freeing of adhesions and the wrapping of the diseased area with omentum. Primary resection has been done and an end-to-end or side-to-side anastomosis made. Mikulicz and obstructive procedures have been recommended. Short circuiting operations, such as joining the ileum to the sigmoid colon, have been performed. A loop of ileum has been used to connect the transverse colon to the sigmoid; and the descending colon resected as described by Pauchet.<sup>22</sup>

Because there is always a certain amount of infection present, a high mortality is associated with all of these procedures. Before any type of plastic operation is done it should be preceded by a cecostomy or colostomy, and the bowel drained for two or three months. This gives the inflammatory process a chance to subside, and a much safer resection can be performed. Many cases subside to such an extent that no further operating is required, except closure of the colostomy. Before closing a colostomy in such a case it is absolutely essential to know that no lower obstruction is present. At times a permanent colostomy is necessary because the diseased portion of the sigmoid is so low that a resection and an anastomosis cannot be satisfactorily performed.

An attempt to close any fistula caused by diverticulitis should be preceded by a drainage operation of the colon above the inflammatory area. These stage operations cause longer hospitalization, and patients object to colostomy, temporary or permanent. But when the factor of increased safety is considered, preliminary drainage is well worth while.

5. When carcinoma is suspected, resection of the inflammatory mass should always be done. The method of resection depends on the findings at exploration. Colostomy should precede this resection. Daniel Jones<sup>2</sup> states that when bleeding comes from above the anal

area in a case of diverticulitis the involved area should always be removed, as there is usually an associated carcinoma.

#### CASE REPORTS

*Case 1.*—W. P., a well nourished male, aged seventy, was seen at his home the night of March 22, 1933. He stated that he had been having pain in the left lower abdomen, diarrhea and bleeding from the rectum for the past twenty-four hours. He had a similar attack two years previously except that there was no bleeding at that time. He had been troubled with flatulence for years.

Abdominal examination revealed tenderness and rigidity over the left lower abdomen, and a sausage-shaped mass was felt in the lower left quadrant. Digital rectal examination was negative except for an enlarged prostate. Patient was given paregoric and heat was applied to the lower abdomen. The following day sigmoidoscopic examination was negative except for bleeding internal hemorrhoids. X-ray with barium enema revealed an obstruction at the recto-sigmoid junction.

The following day, x-ray examination showed extensive diverticulitis of the sigmoid colon. The patient was put to bed in the hospital, morphine and atropine were given and heat applied to the abdomen. The bowel symptoms began to subside and the patient felt considerably better. On March 26, 1933, he could not void and required catheterization. The urinary disturbance continued, and it was necessary to insert a retention catheter into the bladder. A cystoscopic examination on March 30 revealed a median bar obstruction, grade 3.

The patient was prepared for prostatectomy, and on April 11, 1933, a transurethral resection of the prostate was done. An easy convalescence followed, and the patient was discharged from the hospital on April 17, 1933. He was instructed to take mineral oil and live on a smooth diet.

This man has been examined at one to three month intervals since leaving the hospital. He is in good health except at times when he eats rough food or neglects his mineral oil. At the last examination three months ago no abdominal tenderness could be found but a mass could be felt. Barium enema revealed the presence of diverticula but no obstruction.

*Case 2.*—J. K., a moderately obese male, aged forty-five, was examined at the office on March 4, 1932. He stated that two days previously he was taken with severe pain in the left lower abdomen. He had no nausea but had considerable flatulence. He had experienced occasional cramp-like pains in the lower abdomen for the past two years accompanied by diarrhea.

Examination revealed tenderness and rigidity over the lower left abdomen. Digital rectal examination was negative. Temperature was 100°; leukocyte count, 15,000. The patient was sent to the hospital with a tentative diagnosis of diverticulitis of the sigmoid colon. A barium enema confirmed this diagnosis. The patient was put to bed and given morphine and atropine by hypodermic. Hot rectal irrigations were given and heat applied to the abdomen. The next day the patient had more pain and his temperature increased to 101°; the leukocyte count to 17,000. The polymorphonuclear count was 83 per cent. It was thought that a cecostomy should be done. The patient was taken to the operating room and a cecostomy by the Witzel method was performed under gas anesthesia. A moderate post-operative reaction occurred, after which the patient had an uneventful convalescence. The cecostomy closed two weeks after operation. This patient takes mineral oil in one to two dram doses twice a day and lives on a smooth diet. He has had very little abdominal discomfort since his operation.

**Case 3.**—Mrs. F. M., an obese female, aged fifty, was admitted to the hospital, May 28, 1932. She stated that she was having severe pain in the right lower abdomen. She was nauseated, but did not vomit. Abdominal examination revealed rigidity and tenderness over the right lower abdomen. Her temperature was 100.8°, pulse 100, leukocyte count 13,750. Urine was normal. A diagnosis of acute appendicitis was made. The abdomen was explored, and a mass about two inches in diameter was found in the sigmoid colon. The adjacent epiploic tags were inflamed. The omentum was attached to the mass, which was pulled over to the right side of the abdomen. Penrose drains were inserted about the mass and the abdomen closed. The patient's condition was good at the close of the operation; the next day her temperature and pulse became elevated, the abdomen became distended and her general condition grew worse. On June 1, 1932, a transfusion of 500 c.c. of citrated blood was given intravenously. This did no good and death occurred an hour later, evidently from peritonitis. No autopsy was obtained.

**Case 4.**—J. B., an obese male, aged forty-nine, was admitted to the hospital, August 5, 1926. He complained of severe pain in the abdomen. He stated that on August 3 and 4 he had had a cramp-like feeling in the lower abdomen. This became worse on the evening of the fourth, and he had severe pain during the night. At 7 a. m., August 5, he called his physician, who sent him to the hospital immediately. Examination revealed a board-like abdomen, leukocyte count 16,000 with 85 per cent polymorphonuclear cells, temperature 100.4°, and the pulse 92. The abdomen was explored under ether anesthesia. An inflamed mass was found in the sigmoid colon, which was brought out of the abdomen as a first stage Mikulicz procedure. The patient had a comparatively easy convalescence. The second and third stages of Mikulicz operation were carried out later. He is in good health at the present time.

**Case 5.**—L. B. L., a well nourished male, aged forty-seven, was admitted to hospital, June 21, 1928. He stated that for several days he had been passing gas through the urethra. There was no history of pain in the abdomen previous to this. Cystoscopic examination revealed an inflammatory area on the bladder wall. On June 26, the abdomen was opened and a diverticular mass found which was densely adherent to the bladder. This mass was separated from the bladder and brought out of the abdomen as in the first stage Mikulicz procedure. The bladder opening was closed. The patient had a stormy convalescence but gradually improved. He has been free from any urinary or bowel symptoms since his discharge from the hospital, but he has a postoperative hernia.

**Case 6.**—Mrs. G., an obese female, aged fifty-three, was admitted to the hospital February 6, 1928. She had been having intermittent pain in the left lower abdomen for two years. She was constipated and complained of flatulence. She had lost fifteen pounds in two months. Examination revealed slight tenderness and rigidity in the left lower abdomen. A mass could be palpated over the sigmoid colon. Her temperature was 99 to 100 degrees, pulse 98, leukocyte count 13,045. A barium enema revealed a partial obstruction in the sigmoid colon. This was thought to be due to carcinoma. Operation on February 9, 1928, revealed a mass in the sigmoid colon 5 inches by 2 inches. This mass was mobilized and brought out of the abdomen as in the first stage Mikulicz procedure. The second and third stages were done later. Microscopic examination showed diverticulitis. An abscess developed in the abdominal wound, which was drained on the ninth day after exploration. An uneventful convalescence followed.

**Case 7.**—E. M., an obese male, aged forty-three, was examined in the office, January 30, 1935. He stated

that he was awakened one night, six weeks before, by a desire to void. He passed gas and some blood on micturition. There was some burning. There had been no abdominal pain. He consulted a druggist, who prescribed argyrol injections per urethra. The injections helped the burning but he continued to pass gas. Physical examination was negative except the patient was obese. The urine showed considerable pus. A barium enema revealed many diverticula in the sigmoid colon, but no evidence of inflammation could be demonstrated. An inflammatory area was found on the bladder wall on cystoscopic examination. Methylene blue was injected into the rectum and this returned in the urine. The patient is now being prepared for operation.

### Conclusions

1. Diverticulosis and diverticulitis have been properly recognized and treated only within recent years.
2. Diverticulosis occurs in about 5 per cent of all cases studied by colon x-rays. Approximately 12 to 15 per cent of persons with diverticulosis will develop diverticulitis.
3. Diverticulosis is probably caused by increased intracolonic pressure and a weakened bowel wall.
4. Diverticulitis is due to irritation and infection occurring in diverticula, particularly in the sigmoid portion of the colon.
5. The severity of symptoms corresponds to the degree of pathological process present.
6. X-ray is a valuable diagnostic aid.
7. The treatment of diverticulosis and mild diverticulitis is medical, and that of severe diverticulitis is surgical.
8. Plastic procedures for the relief of diverticulitis should be preceded by colostomy or cecostomy.
9. Because of the possibility of carcinoma, all bleeding cases should be explored and the mass resected.

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### Discussion

DR. E. T. BELL: Dr. Jones has given us a good general survey of this field. I might comment a little on the basic principles involved in diverticulosis. The same fundamental principle obtains here as in a femoral or inguinal hernia, the weakness of the wall and the increased pressure from the inside.

In some parts of the intestinal tract, like the small intestine, there is no doubt that congenital weakness of the wall is the most important factor. The muscle wall is thin where the large blood vessels come in on the mesenteric border and the diverticulum dissects along through the defect in the wall made by these blood vessels. In the small intestine, diverticula are very rare in comparison with the sigmoid and they are very seldom recognized clinically. In our experience we have had only one clinical case of diverticulitis in the small intestine. Death resulted from the infection. The roentgenologists will tell you they often see diverticula in the duodenum but that they seldom cause symptoms. In the pelvic colon we think there is a congenital factor also, but it is less important than in other situations.

The factor of distention is very important. The muscle layers are spread out over the wall of the intestine but often quite unevenly. If you study a colon you will see the three longitudinal bands of muscle with big defects between them. The layer of muscle is not uniform everywhere and when the intestine is put under the tension, chiefly from gas, as Dr. Jones points out, the hernia starts through these little places where the muscle is not so strong, always on the antimesenteric border. We cannot get away from the fact that there must be a primary weakness of the wall, due to the uneven distribution of the muscle. The hernia at times goes out into the epiploic appendage. This fact gives rise to the theory that the infiltration of adipose tissue weakens the wall. Another thing we have to consider besides the fecalith is stasis in the diverticula. The fecalith is the more important—the stool gets hard and irritates the mucosa; but some develop diverticulitis without the fecalith. If you examine the intestine from the inside, the opening into the diverticulum is seen to be quite small in

comparison with the size of the sac. Stasis of fecal contents increased the virulence of bacteria.

In the small bowel, bacteria are much less numerous and there is therefore less tendency to the development of infection. In the duodenum there are very few bacteria and diverticulitis is very rare. The bladder is a good example of diverticulitis where the congenital factor is prominent. The muscle bundles are unevenly distributed and they are pulled apart when the viscus is distended. There must be stretching before the diverticulum is formed. The diverticulum itself is not congenital. Studies have been made on the sigmoid in different stages. At first the diverticula are few and small and later they are more numerous and larger. They develop while the patient is under observation.

DR. E. C. ROBITSHEK: In these cases of diverticulosis and acute diverticulitis I should like to emphasize the need of extreme caution in the use of enemas as a therapeutic measure, because of the likelihood and danger of causing a perforation. I have had but few of these cases and when I thought I had recognized one, I would not permit the use of an enema.

DR. L. HAYNES FOWLER: While listening to Dr. Jones' very interesting paper and particularly in respect to his observation on the relation of diverticula to intracolonic pressure, it struck me as a rather curious fact that I have never seen the report of a case in which diverticula were associated with megacolon although distention and pressure are at their maximum in this condition. I suppose this may be partially explained by the large amount of muscular hypertrophy which is present in cases of megacolon.

DR. O. J. CAMPBELL: I did not hear Dr. Jones mention the associated spasm which may accompany acute diverticulitis. I recall one patient in whom the picture was that of a very acute abdomen except for a low leukocyte count and no fever. The following day every symptom had subsided. Diverticula were demonstrated by x-ray. The assumption was that a low grade inflammatory process was present in one of the diverticula but his symptoms could be explained only on the basis of spasm. I am under the impression that such an association is frequent.

DR. J. A. JOHNSON: When diverticulitis occurs in the pelvic sigmoid it is very difficult to handle surgically. Many of these cases perforate and become attached to the posterior abdominal wall in the pelvis. They are difficult to distinguish from carcinoma but, fortunately, the x-ray often gives us quite a definite picture that we can rely upon. Many of these cases progress very nicely under medical management, even though a marked degree of obstruction is present. If anything is done, surgically, the tumor should not be dissected free because there is great danger of peritonitis. A colostomy should be done. Under this management, if they are not malignant, the great majority of them subside. When perforation has taken place it is dangerous to operate primarily upon the diverticulitis.

DR. WILLIAM T. PAYTON: My experience with this lesion is that it involves a greater area of the bowel than carcinoma and it gives a longer history than one would get with carcinoma.

At the time this lesion is operated upon, if you are still in doubt as to whether or not it is malignant, it is of value to recall that in diverticulitis there are inflammatory changes and you see adhesions with increased vascularity everywhere in evidence. In the x-ray, particularly, you note the spasm which has been mentioned tonight in cases of diverticulitis. In carcinoma that part of the bowel which is involved appears rigid in the screen and film with no peristalsis in the area involved. I have seen a case of diverticulitis that had been operated on seven years previously, a colostomy having been done. The family had been told that the patient had carcinoma. They were still wondering why she had not died.

DR. W. R. JONES: Spasm might occur in diverticula due to irritation from a fecalith. However, I believe that this is infrequent and that usually there is an inflammatory process present. This inflammation, many times, subsides very quickly.

### MEGACOLON

#### With Report of a Case Caused by a Traumatic Anal Stricture

##### Treatment by Left Lumbar Sympathectomy

L. Haynes Fowler, M.D.

(Paper to appear later in MINNESOTA MEDICINE)

##### Summary

Megacolon is a term used to describe any dilated, hypertrophied colon. It may be either congenital or acquired. Congenital, idiopathic megacolon (Hirschsprung's Disease) is a clinical entity usually seen in infancy or early childhood. It is characterized by a hugely dilated hypertrophied colon with obstipation and abdominal distention. It is considered to be of neurogenic origin although the exact etiological factors are unknown. Medical and surgical treatment have been unsatisfactory until the advent of a method of surgical attack upon the sympathetic nervous system.

Various operative procedures on the abdominal sympathetic nerves have been developed for the treatment of this disease, the object of which is to remove the sympathetic nerves which supply the portion of the bowel chiefly affected. All of these operations are based on the fairly well established physiological principle that the sympathetic nerves are inhibitors of the smooth muscle of the bowel wall and contractors of the internal sphincter muscles. Overactivity of these nerves causes dilatation of the bowel and contraction of the sphincters. Sufficient experimental and clinical evidence has been offered to prove the value of sympathetic nerve resection in properly selected cases of megacolon.

A case is reported of a girl, twenty-two years of age, with a hugely dilated rectum and sigmoid colon filling the entire abdomen, in whom we resected the left lumbar sympathetic trunk and ganglia, twenty-one months

ago. Very satisfactory results have been obtained in this case as demonstrated by clinical improvement and x-ray plates taken after a barium enema. This patient had most of the classical features of a typical congenital megacolon (Hirschsprung's Disease) but had the additional element of a traumatic anal stricture developing at six months of age. This was incised and the stricture apparently relieved (at seven years of age) without inhibiting the further progress of the disease. We believe, therefore, that this must be considered as a case of acquired megacolon due to obstruction from a traumatic anal stricture resulting from a burn sustained soon after birth. The mechanical obstruction, which was present for six and one-half years, apparently caused such an interference with the neuromuscular mechanism of the bowel that the latter continued in a state of increasing imbalance for thirteen and one-half years after the mechanical obstruction had been relieved. Restoration of normal bowel function has been obtained by left lumbar sympathectomy after twenty years of dysfunction.

### Discussion

DR. J. C. MCKINLEY: Dr. Fowler has certainly given a very clear presentation of the neural mechanisms involved in the operative procedure for this condition.

A number of questions occurred to me in connection with the data presented. As far as I can find, there is no clear understanding of the exact course of the sacral fibers from the point where they enter the hypogastric plexus to their final distribution in the descending part of the colon. Certainly they do not go along with the sympathetic fibers. I am wondering if Dr. Fowler has seen anything in the literature on that specific point.

The observation on this case, with spinal anesthesia, is interesting. I do not think it is quite fair to assume that, because the bowel is more active during the anesthetic, the autonomic is therefore acting normally, for at least the sacral autonomic must be paralyzed at the same time.

I wonder if peripheral mechanisms may not be overlooked as a factor in the cures one gets with this type of surgery. There, doubtless, are peripheral reflexes in the bowel itself. It has been shown (*Kuntz, Autonomic Nervous System*) that sharp pointed objects in the bowel will come to take up a certain position. A pin apparently will point with the head downward toward the anus. If the point of the pin gets into the mucosa it is said that the mucosa will actually retract from that point.

The return of rectal continence after the sympathectomy, in Dr. Fowler's case, is an interesting phenomenon. There is a special situation relative to the control of the anus because the nerves to the voluntary sphincter have not been disturbed. It may be that by the release of pressure with cure of the megacolon, the voluntary sphincter has an opportunity to work under more normal pressure conditions, and thus to become competent again.

DR. E. C. ROBITSHEK: Dr. Fowler mentioned something in the recent literature about the use of spinal anesthesia in these cases which I recall reading. This



was an article by Stabins\* and his associates in which they reported five cases of megacolon in which spinal anesthesia has resulted in a marked improvement in the motor function of the bowel. In their cases, improvement has continued to the point of practically complete relief of symptoms without having to repeat the spinal anesthesia. They recommend the use of spinal anesthesia as a pre-operative index because, where a positive motor response is shown, the results of sympathectomy are very satisfactory. However, in addition, before considering sympathectomy, the effect of spinal anesthesia on the course of the disease should be considered as this procedure alone may be sufficient.

DR. E. T. BELL: I have seen two cases where the proximal half of the colon showed this condition, not the distal half. There is a fundamental problem here which is very hard to understand. These patients, with megacolon, have marked hypertrophy of the muscle wall but they do not show increased peristalsis. In the obstruction, due to carcinoma, there is increased peristalsis in the earlier stages but I do not know whether that continued over into the stage of massive megacolon or not. Here is a colon which develops a tremendous hypertrophy of the muscle, but shows no obstruction of any kind and no increased peristalsis. How are we going to account for this muscle hypertrophy? Can we suppose that stretching causes muscle hypertrophy?

DR. R. T. KNIGHT: I did not quite understand Dr. McKinley's remark about the autonomic. I presume he means the sacral parasympathetic. Does the sacral parasympathetic innervate the lower one-half of the colon as it does the pelvic structures, the uterus, etc., or does the vagus supply the parasympathetic innervation to the lower part of the colon?

DR. J. C. MCKINLEY: As far as I can discover, the sacral outflow apparently does innervate most of the descending part of the colon. How much additional autonomic innervation comes down from above is a question that has not been entirely elucidated and that, of course, is very pertinent in relation to the results under spinal anesthesia.

DR. R. T. KNIGHT: This is a little bit aside, but the question of anesthesia in general, in connection with these things and with the ordinary normal bowel, is rather interesting. We see, under spinal anesthesia, our entire bowel contracted in the abdomen and under ether anesthesia we usually see a somewhat dilated bowel because deep ether anesthesia begins to inhibit the entire parasympathetic, including the vagus. Under cyclopropane, apparently the parasympathetic is left entirely unaffected even when great muscular relaxation has been accomplished. We then usually see the bowel contracted in the abdomen almost the same as in spinal anesthesia, a complete inhibition of the sympathetic but the parasympathetic being left quite unaffected.

DR. L. HAYNES FOWLER: I wish to thank the gentlemen for their very kind and interesting discussion of this paper. I think this discussion has brought out the fact that there is a great deal that is yet unknown

about the anatomy and physiology of the sympathetic nervous system in general, and its relation to the large bowel, in particular. In my survey of the literature, it was evident that the best authorities are at variance on a great many points. The proximal half of the colon is supposed to receive its parasympathetic nerve supply through the vagus, while the distal half of the colon, rectum and internal sphincter are supplied by visceral rami of the second, third and fourth sacral nerves. Just how these sacral fibers reach the descending colon and sigmoid is not well established.

As to the point Dr. McKinley brings out, it is quite universally agreed that there is a definite intrinsic neuro-muscular mechanism in the bowel wall itself which will function to a certain extent even though both the sympathetic and parasympathetic nerves have been severed.

As to Dr. Bell's question regarding the involvement of the proximal one-half of the colon, there is a considerable group of cases reported in which the proximal as well as the distal half of the colon is dilated. However, it would be very unusual to find the proximal half alone involved. The maximal dilatation is found in the descending colon in the majority of cases and in the sigmoid in over 50 per cent of cases.

In regard to Dr. Bell's question as to how much peristalsis is found in obstructive cases, I cannot answer that definitely. In cases such as the one reported tonight in which an obstructive element was undoubtedly present but which was of a slow chronic nature, peristalsis would be absent. If the obstruction were more acute and of shorter duration, I would expect to see more evidence of the presence of peristalsis. Rankin reports that specimens removed from patients with megacolon due to obstruction by malignant growths show definite muscular hypertrophy similar to that found in the true congenital type of megacolon.

The case reported tonight, I believe, should be classed as one of megacolon initiated, in all probability, by a traumatic anal stricture. The typical pathological and clinical picture of a congenital megacolon was produced. Left lumbar ganglionectomy and ramisection have given a very satisfactory result as evidenced both by the clinical improvement of the patient and x-ray plates of the colon after a barium meal.

Respectfully submitted,

F. A. OLSON, *Secretary*.

Hydrochloric Acid in Hay Fever.—Beckman (J. Allergy, 1:496 (Sept.) 1930) reported 67 per cent of complete or marked relief in 237 hay fever cases by the oral administration of nitrohydrochloric acid; this figure was about equal to that obtained by leading allergists with the usual desensitization method of injections of specific pollen extracts. Many other workers have argued this point both before and after Beckman's article, and the consensus, especially among leading allergists, is about as follows: 1. No one has proved that hay fever or other allergic disease is due to a lack of acid (i.e., an alkalosis). 2. Although the method has been tried by many allergists, in general it has not been successful in alleviating the symptoms of hay fever. The intravenous injection of dilute hydrochloric acid recently advocated in allergic conditions is not without danger; its usefulness in these disorders is quite questionable. (Jour. A. M. A., September 22, 1934.)

\*Stabins, Morton and Scott: Spinal anesthesia in the treatment of megacolon and obstinate constipation. *Am. Jour. Surg.*, 72:107, (Jan.) 1935.

## BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

**NAMES OF SURGICAL OPERATIONS.** Compiled and arranged by the Western Surgical Association through its Special Committee. 102 pages. Price, cloth, \$3.00. St. Paul: Bruce Publishing Company, 1935.

**THE MODERN METHOD OF BIRTH CONTROL.** Thurston Scott Welton, M.D., F.A.C.S., Editor of American Journal of Surgery. 159 pages. Illus. Price, cloth, \$3.00. New York: Walter J. Black, Inc., 1935.

**SURGICAL PATHOLOGY OF THE PERITONEUM.** Arthur E. Hertzler, M.D., Surgeon to Agnes Hertzler Memorial Hospital, Halstead, Kansas, Professor of Surgery, University of Kansas. 305 pages. Illus. Price, cloth, \$5.00. Philadelphia: J. B. Lippincott Co., 1935.

**AUTONOMIC DISEASES OF THE RHEUMATIC SYNDROME.** T. M. Rivers, M.D. Author of Focal Infections, the Resulting Morbidity and Treatment of Same, etc. 299 pages. Price, cloth, \$3.00. Philadelphia: Dorrance & Co., Inc., 1935.

**DOCTORS AND JURIES.** Humphreys Springstun, of the Detroit Bar. 155 pages. Price, flexible binding, \$2.00. Philadelphia: P. Blakiston's Son & So., Inc., 1935.

**A TEXTBOOK OF BIOCHEMISTRY.** Benjamin Harrow, Ph.D., Associate Professor of Chemistry, College of City of New York, and Carl P. Sherwin, M.D., Sc.D., Dr.P.H., LL.D., Member of Staff of St. Vincent's and French Hospitals, New York. 797 pages. Illus. Price, cloth, \$6.00. Philadelphia: W. B. Saunders Co., 1935.

**ECONOMIC PROBLEMS OF MEDICINE.** A. C. Christie, M.S., M.D., Professor of Clinical Radiology, Georgetown University Medical School, etc. 242 pages. Price, cloth, \$2.00. New York: The MacMillan Company, 1935.

**USEFUL DRUGS: A LIST OF DRUGS SELECTED TO SUPPLY THE DEMAND FOR A LESS EXTENSIVE MATERIA MEDICA WITH A BRIEF DISCUSSION OF THEIR ACTIONS, USES AND DOSAGE.** Edited by Robert A. Hatcher, Ph.M., Sc.D., M.D., and Cary Eggleston, M.D. Prepared under the Direction and Supervision of the Council on Pharmacy and Chemistry of the American Medical Association. Ninth edition. Cloth. 203 pages. Price, 60 cents. Chicago: American Medical Association, 1934.

This book represents a valuable and increasingly effective phase of the efforts of the Council on Pharmacy and Chemistry on behalf of rational therapeutics. Since its first appearance in 1913 it has become a recognized work in its field. It has been adopted as a textbook by teachers of therapeutics in the best medi-

cal schools and by various examining and licensing boards. The various editions and revisions since that time have been undertaken in the effort to keep it abreast with the advance of therapeutics. Drugs that have become obsolete have been deleted, and others the value of which has become established have been added. The statements of actions, uses and dosage of the various drugs are revised after discussion by the whole Council. They represent the latest and best results of therapeutics and pharmacologic revision. The present edition is in line with the constant aim of the Council, which has been to present a selective and informative yet comprehensive compendium of the more useful preparations in the medical armamentarium. There have been some additions to the list of drugs and a few have been deleted. Individual descriptions show evidence of careful editing. Typographically the text is an improvement on previous editions by reason of more generous spacing, which makes it easier on the eyes. As it stands, the book is an authoritative, intelligent, critical and entirely adequate textbook for the use of teachers and examiners, as well as for reference by the busy practitioner. It is an integral and constructive part of the Council's efforts in the promotion of the rational use of drugs.

**CLINICAL GYNECOLOGY.** C. Jeff Miller, M.D. 560 pages. Illus. Price \$10.00. St. Louis: C. V. Mosby Co., 1932.

It has been said that Gynecologists may be divided into two groups; those who are cancer minded and those who are not. Doctor Miller has shown in his book that he can be classed in the former group.

This book contains many excellent pointers upon practical therapeutics in gynecology which are of value not only to the specialist but also to the general man. Stress is laid upon conditions which are most commonly seen and Doctor Miller's advice is that of the best. Technique of many procedures is sketchy but the main principles and tenets are plainly stated and emphasized.

The handling of the chapter upon Irradiation in Gynecology is commendable, but I believe more emphasis should have been laid upon the associated use of radium and x-ray, especially in malignancies. His chapter upon the endocrines is brief and to the point and no extra space is filled with descriptions of treatment with preparations of questionable value.

This is a book which is well written and organized and it can be highly recommended to all.

E. M. KASPER, M.D.

**METHODS OF TREATMENT.** Logan Clendening, M.D., Clinical Professor of Medicine, University of Kansas. Fifth Edition, 879 pages. Illus. Price \$10.00. St. Louis: The C. V. Mosby Company, 1935.

Many books on medical therapeutics have "come and gone" and only a few have succeeded in more than one edition. Logan Clendening and his collaborators have succeeded in keeping up to date his well known book on Methods of Treatment. It first appeared in 1924

## BOOK REVIEWS

and now in 1935 is in its fifth edition. In this thoroughly revised book, only the "tried by trial" methods of treatment are listed, and such drugs as have proved helpful in the hands of the author have been advocated.

Truly the aim of the author has been reached in describing each method of procedure so clearly and minutely that a person who has never seen it performed could do it from the description.

The book is to be recommended, both to the student and to the graduate in medicine.

J. S. B.

**THE CRIPPLED AND DISABLED.** Henry H. Kessler, M.D. 337 pages. Price \$4.00. New York: Columbia University Press, 1935.

This is a work outlining the problems of the physically disabled in coping with his environment. Rehabilitation and compensation legislation and agencies of the United States and foreign countries are compared, and further work along these lines suggested. The author feels the main problem to be one of vocational maladjustment due in large part to prejudice against the disabled which can only be adjusted by propaganda and education. The need of more accurate criteria for estimating disability is emphasized.

S. W. SHIMONEK, M.D.

**INTRODUCTION TO DERMATOLOGY.** Richard L. Sutton, M.D., Professor of Dermatology, University of Kansas and Richard L. Sutton, Jr., M.D., Assistant in Dermatology, University of Kansas. 565 pages. Illus. St. Louis: C. V. Mosby Company, 1932.

The title of this book describes it very well. It is a concise, well written outline with enough text to make it of value to the practitioner as well as the student. The material included in this book covers the field of dermatology very well, but for detailed study a more complete textbook would be found necessary.

L. R. CRITCHFIELD, M.D.

**WHAT YOU SHOULD KNOW ABOUT HEART DISEASE.** Harold E. B. Pardee. 2nd revised edition. Philadelphia: Lea & Febiger, 1935. Price \$1.50, pp. 127. Illus.

For a long time it has been the reviewer's practice in dealing with patients with heart disability to explain as concisely as possible the causes and effects of the condition present. To dispel fear and instill confidence is one of the desirable therapeutic adjuncts of any treatment to be instituted, and securing the necessary coöperation of the patient materially aids the physician in his care of the patient. I have previously made use of Dr. Pardee's first edition, which is the best book of its kind that I know of. Dr. Pardee talks to the patient directly in non-technical language to the end that one ordinarily intelligent may comprehend just what is meant by heart disease, the nature of the disability, and how to coöperate properly with the physician in trying to correct the unpleasant results of the

disease. The book is well arranged and is sufficiently comprehensive since it includes chapters on diets, rest and exercise, medicinal treatment and prognosis. The book ends with a word on the necessary limitations imposed and the necessity of avoiding undue stress and strain and with the admonition, "Learn to say 'No.'"

Many will find this little volume to be of definite assistance to them in helping their patient. I enthusiastically recommend it for the purpose for which it was intended.

T. A. PEPPARD, M.D.

**COMPARABILITY OF MATERNAL MORTALITY RATES IN THE UNITED STATES AND CERTAIN FOREIGN COUNTRIES:** Bureau Publication No. 229, U. S. Dept. of Labor, Children's Bureau. By Elizabeth C. Tandy, D.Sc.

This pamphlet gives the report of a subcommittee of the Committee on Prenatal and Maternal Care of the White House Conference on Child Health and Protection, of which Dr. Fred L. Adair was chairman. A table showing the maternal mortality rates from 1925 to 1933 of certain countries, together with the conclusions drawn by the author from the study follow. The Minnesota rates have been added for comparison.

DEATHS ASSIGNED TO PREGNANCY AND CHILDBIRTH PER 10,000 LIVE BIRTHS

Country	1925	1926	1927	1928	1929	1930	1931	1932	1933
United States.....	64.7	65.6	64.7	69.2	69.5	67.3	66.1	63.3	61.9
Minnesota.....	51.5	57.9	42.6	52.5	42.6	53.5	48.5	45.0	43.4
Australia.....	56.4	53.0	59.2	59.8	50.8	53.0	54.8	55.7	51.3
Canada.....	56.4	56.6	55.5	56.2	57.0	57.7	50.5	50.2	49.7
Chile.....	61.1	58.3	57.7	58.6	77.8	67.7	75.0	71.0	....
Czechoslovakia.....	33.3	34.0	35.8	39.7	42.8	40.7	41.4	42.8	48.5
Denmark.....	23.6	26.6	30.6	27.0	31.7	38.3	40.5	35.0	36.5
England and Wales.....	40.8	41.2	41.1	44.2	43.4	44.0	41.1	42.1	43.2
Estonia.....	38.2	40.5	41.1	50.3	46.0	49.3	42.5	33.9	....
France.....	23.8	24.4	28.7	29.0	29.3	26.7	24.9	....	....
Irish Free State.....	46.9	48.9	45.1	49.3	41.0	47.6	43.1	45.5	....
Italy.....	28.1	25.5	26.4	28.0	28.8	27.2	27.8	29.8	....
Netherlands.....	26.3	28.7	29.0	33.6	33.5	33.3	32.0	30.2	31.6
New Zealand.....	46.5	42.5	49.1	49.3	48.2	50.8	47.7	40.6	44.4
Northern Ireland.....	44.4	56.1	48.0	52.4	49.2	52.9	51.4	53.4	....
Norway.....	26.8	31.8	24.5	30.3	36.2	30.3	27.0	26.4	....
Scotland.....	61.0	64.0	64.3	69.8	68.7	69.5	59.1	63.3	59.2
Sweden.....	26.3	29.4	27.8	33.0	37.9	34.8	36.8	26.6	....

The study shows: That the methods of assignment in use in Australia, Netherlands, New Zealand, and Scotland are similar to that of the United States, and the official maternal mortality rates are directly comparable within a small margin of error; that under the method of Denmark a larger number of deaths would be assigned to the puerperal state and the rate for the United States would be significantly higher than it is now; that under the methods of the other countries included in the study—Canada, Chile, Czechoslovakia, England and Wales, Estonia, France, Irish Free State, Italy, Northern Ireland, Norway, and Sweden—a smaller number of deaths would be assigned to the puerperal state and the rates for the United States would consequently be somewhat lower. Second: That dif-

ferences in methods of assignment are insufficient to explain the high maternal mortality rate of the United States as compared with foreign countries. The official figure of the United States, which in the last few years has exceeded that of every country except Scotland, remains high no matter what method of assignment is used. Even if the method of the country assigning the smallest proportion of deaths to the puerperal state were in use in the United States, the United States figure would still exceed that of all the countries except Australia, Canada, Chile, and Scotland. Rates for the United States estimated in accordance with the assignment procedure of the respective countries are in every instance except Scotland in excess of and are in five instances more than double the official rates of the countries themselves. No matter what method of procedure is used the United States retains an exceedingly high rate as compared with other countries.

Difference in definition of live births is shown to have a negligible effect upon maternal mortality rates. Incompleteness of birth registration has more weight, but it, too, is insufficient to account for more than a few points of the excess of the United States rate over those of most foreign countries. Neither factor is of great importance in connection with comparability.

E. C. HARTLEY, M.D.

**MARTINI'S PRINCIPLES AND PRACTICE OF PHYSICAL DIAGNOSIS.** Edited by Robt. F. Loeb, Translated by George J. Farber. 213 pp. Illus. Price \$2.00. Philadelphia: J. B. Lippincott Co., 1935.

This reviewer gladly welcomes this volume on physical diagnosis. No one is better qualified for its authorship than Dr. Martini, a pupil of Friedrich von Miller. Especially pertinent, instructive and lucid is the section on the physics of diagnostic acoustics. The book is well arranged and adequately indexed. At the end of the chapters on the Respiratory Tract and the Circulatory System is given a synopsis to correlate the foregoing discussions with the physical findings as they usually appear in the various disease states. There is a good chapter on examination of the abdominal organs.

I unhesitatingly recommend this book to students of physical diagnosis and it is not at all out of place in the library of any practitioner.

T. A. PEPPARD, M.D.

#### ADRENAL CORTEX EXTRACT

After a consideration of the several names suggested for the extract containing the hormone of the adrenal cortex, and for the hormone itself, the Council decided that it would be advisable at this time to adopt a generally descriptive nonproprietary name for the more or less crude extracts and to defer until later the consideration of a name for the active isolated principle. The Council therefore adopted the title "Adrenal Cortex Extract" (with the Latin synonym "Extractum Adrenali Corticis") as its nonproprietary name for extractive preparations from the adrenal gland that contain the cortical hormone necessary for life. (*Jour. A. M. A.*, January 12, 1935, p. 121.)

#### TRYPSOGEN-CARNRICK

Notwithstanding the vast amount of research that has been published on the treatment of diabetes, the G. W. Carnrick Company, Newark, N. J., continues to recommend "Trypsogen" as "a valuable therapeutic agent" in the treatment of this disease. Over the years, "Trypsogen" has had a variety of formulas. Once even such inorganic compounds as gold bromide and arsenic bromide were included in it. It has never been demonstrated that Trypsogen contains insulin, yet insulin is, of course, "the special internal secretory substance" that controls normal carbohydrate metabolism, as claimed by the firm. Today the use of pancreatic extracts by mouth in diabetes is ignorant, unscientific and absolutely without warrant. The doctor who gives such preparations by mouth to the exclusion of the well established and effective methods of treatment involving proper control of the diet and the use of insulin might well be charged with failing to give his patient the ordinary scientific care expected from any average physician in such a condition. Not satisfied, however, with the money it extracts from patients with diabetes, the firm has recently suggested the use of the product "as an adjunct in hypertension." Obviously there is not the slightest scientific evidence to indicate that it has merit in hypertensive disorders. (*Jour. A. M. A.*, Dec. 8, 1934, p. 1782.)

#### MIN-AMIN

The Bureau of Investigation reports that during the past few months a large number of inquiries have been received asking for information on a preparation for the treatment of obesity known as "Min-amin." The only information regarding the composition of Min-amin that appears on the trade package is the vague statement that it is "a combination of pure food concentrates containing minerals and vitamins." The product is manufactured by the National Institute of Nutrition, Los Angeles, and is recommended for the treatment of obesity by Dr. William Brady, whose syndicated health columns appear in a number of papers throughout the country. Dr. Brady propounds the thesis that much good, wholesome food is deficient in vitamins and minerals, and that the obese eat more food than their bodies require because of an unsatisfied hunger allegedly due to the fact that they are getting insufficient vitamins and minerals. He recommends the use of Min-amin and says: "With Min-amin, which is a concentrate of the essential minerals and vitamins in the proper proportion this deficiency of everyday diet is corrected. . . ." One original specimen of Min-amin was examined in the A. M. A. Chemical Laboratory and found to consist essentially of a relatively pure sample of wheat germ. Essentially, the directions are for the obese to eat no breakfast and no luncheon, but to take instead of each of these meals a rounded teaspoonful of Min-amin in an eight-ounce glass of freshly-made unstrained orange juice. For dinner, or the evening meal, they must eat no bread-stuffs, no potatoes, no fats, no sweets, and if a salad is used, it should be made with mineral oil. The obese are told that this regimen does not constitute "self-denial!" No definite statements are made regarding which vitamins are present in Min-amin, nor is there any hint, either in terms of recognized vitamin units or otherwise, as to how much of each vitamin may be present! Wheat germ is rich in vitamin B. On the Min-amin theory, then, one would be led to expect that the obese had an unsatisfied hunger because of lack of vitamin B in their normal diet. The facts are, however, that it is rather generally held that lack of vitamin B in the diet definitely causes a loss of appetite instead of an increase of appetite. (*Jour. A. M. A.*, January 26, 1935, p. 335.)



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MRS. NEIL S. DUNGAY.....	<i>Auditor.</i>	Northfield
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MRS. J. A. THABES.....	<i>Historian.</i>	Brainerd
MRS. A. A. PASSER.....	<i>Past President.</i>	Olivia

### CHAIRMEN OF COMMITTEES

Organizations—MRS. F. J. ELIAS.....	Duluth
Finance—MRS. S. S. HESSELGRAVE.....	St. Paul
Legislation—MRS. J. O. McKEON.....	Montgomery
Public Relations—MRS. E. A. EBERLIN.....	Glenwood
Hygeia—MRS. H. B. BAILEY.....	Fairmont
Health Education—MRS. A. M. NICHOLSON.....	Duluth
Editor—MRS. C. F. EWING.....	Wheaton
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Printing—MRS. E. C. ESHELBY.....	St. Paul
Resolutions—MRS. R. J. JOSEWSKI.....	Stillwater
Social—MRS. F. A. ERB.....	Minneapolis
MRS. J. J. RYAN.....	St. Paul

## COUNCILOR DISTRICTS

### DISTRICT NO. 1

H. Z. GIFFIN, M.D.....Rochester  
Counties—Dodge, Fillmore, Freeborn, Goodhue,  
Houston, Mower, Olmsted, Rice, Steele,  
Wabasha, Winona

### DISTRICT NO. 2

L. L. SOGGE, M.D.....Windom  
Counties—Cottonwood, Faribault, Jackson, Martin,  
Murray, Nobles, Pipestone, Rock, Watonwan

### DISTRICT NO. 3

H. M. WORKMAN, M.D.....Tracy  
Counties—Big Stone, Brown, Chippewa, Kandiyohi,  
Lac Qui Parle, Lincoln, Lyon, Meeker, Pope,  
Redwood, Stevens, Swift, Traverse,  
Yellow Medicine

### DISTRICT NO. 4

J. S. HOLBROOK, M.D.....Mankato  
Counties—Blue Earth, Carver, LeSueur, McLeod,  
Nicollet, Renville, Scott, Sibley, Waseca

### DISTRICT NO. 9

B. S. ADAMS, M.D.....Hibbing  
Counties—Carlton, Cook, Itasca, Lake, St. Louis

### DISTRICT NO. 5

G. A. EARL, M.D.....Saint Paul  
Counties—Anoka, Chisago, Dakota, Isanti, Kanabec,  
Mille Lacs, Pine, Ramsey, Sherburne, Washington

### DISTRICT NO. 6

J. M. HAYES, M.D.....Minneapolis  
Counties—Hennepin, Wright

### DISTRICT NO. 7

W. W. WILL, M.D.....Bertha  
Counties—Aitkin, Beltrami, Benton, Cass, Clear-  
water, Crow Wing, Hubbard, Morrison, Koo-  
chiching, Stearns, Todd, Wadena

### DISTRICT NO. 8

W. L. BURNAP, M.D.....Fergus Falls  
Counties—Becker, Clay, Douglas, Grant, Kittson,  
Lake of the Woods, Mahnomen, Marshall,  
Norman, Otter Tail, Pennington, Polk, Red  
Lake, Roseau, Wilkin

# MINNESOTA STATE MEDICAL ASSOCIATION

## COUNTY SOCIETY ROSTER

### BLUE EARTH COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of each month  
Annual meeting, December  
Number of Members: 30

President  
Sohmer, A. E. . . . . Mankato

Secretary  
Koenigsberger, Charles. . . . . Mankato

Andrews, R. N. . . . . Mankato  
Benham, E. W. . . . . Mankato  
Black, William. . . . . Mankato  
Butzer, J. A. . . . . Mankato  
Dahl, G. A. . . . . Mankato  
Denman, A. V. . . . . Mankato

Edwards, R. T. . . . . Elysian  
Fugina, G. R. . . . . Mankato  
Franchere, F. W. . . . . Lake Crystal  
Haes, J. E. . . . . Vernon Center  
Hassett, R. G. . . . . Mankato  
Holbrook, J. S. . . . . Mankato  
Huffington, H. L. . . . . Mankato  
Juliar, R. O. . . . . St. Clair  
Koenigsberger, Charles. . . . . Mankato  
Liedloff, A. G. . . . . Mankato  
Lloyd, H. J. . . . . Mankato

Macbeth, J. L. . . . . St. Clair  
Miller, V. L. . . . . Mankato  
Osborn, Lida. . . . . Mankato  
Samuelson, L. G. . . . . Mankato  
Schlesselman, J. T. . . . . Mankato  
Schmidt, P. A. . . . . Good Thunder  
Sohmer, A. E. . . . . Mankato  
Stillwell, W. C. . . . . Mankato  
Troost, H. B. . . . . Mankato  
Vezina, J. C. . . . . Mapleton  
Wentworth, A. J. . . . . Mankato  
Williams, H. O. . . . . Lake Crystal

### BLUE EARTH VALLEY MEDICAL SOCIETY

Faribault and Martin Counties  
Regular meetings, First Thursday of February, May, August and November  
Annual meeting, First Thursday in November  
Number of Members: 34

President  
Syblrud, S. W. . . . . Briceclyn

Secretary  
Chambers, W. C. . . . . Blue Earth

Bailey, H. B. . . . . Fairmont  
Barr, W. H. . . . . Wells  
Blanchard, H. G. . . . . Fairmont  
Boysen, Herbert. . . . . Welcome  
Butz, J. A. . . . . Triumph  
Chambers, W. C. . . . . Blue Earth

Cooper, M. D. . . . . Winnebago  
Demo, P. W. . . . . Wells  
Durgin, F. L. . . . . Winnebago  
Farrish, R. C. . . . . Sherburn  
Folta, John. . . . . Ceylon  
Gardner, V. H. . . . . Fairmont  
Heimark, J. J. . . . . Fairmont  
Henderson, A. J. . . . . Kiester  
Holm, P. F. . . . . Wells  
Hunt, R. C. . . . . Fairmont  
Hunte, A. F. . . . . Bylas, Arizona  
Jacobs, A. C. . . . . Elmore  
Johnson, H. P. . . . . Fairmont  
Logan, F. W. . . . . Blue Earth

Luedtke, G. H. . . . . Fairmont  
McGroarty, J. J. . . . . Easton  
Miller, H. A. . . . . Fairmont  
Mills, J. L. . . . . Winnebago  
Richardson, W. J. . . . . Fairmont  
Rowe, W. H. . . . . Fairmont  
Russ, H. H. . . . . Blue Earth  
Sommer, A. W. . . . . Elmore  
Syblrud, H. W. . . . . Briceclyn  
Thayer, E. A. . . . . Truman  
Vaughan, V. M. . . . . Truman  
Wells, W. B. . . . . Sherburn  
Wilson, C. E. . . . . Blue Earth  
Zemke, E. E. . . . . Fairmont

### CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle, and Yellow Medicine Counties  
Regular meetings, every two weeks in Fall and Spring  
Annual meeting, November  
Number of Members: 22

President  
Nelson, M. S. . . . . Granite Falls

Secretary  
Westby, Nels. . . . . Madison

Bacon, R. S. . . . . Montevideo  
Bergh, L. N. . . . . Montevideo

Burns, M. A. . . . . Milan  
Cress, E. E. . . . . Boyd  
Foshager, H. T. . . . . Clara City  
Hauge, M. I. . . . . Clarkfield  
Hauge, M. M. . . . . Clarkfield  
Herbert, W. L. . . . . Maynard  
Holmberg, L. J. . . . . Canby  
Johnson, C. M. . . . . Dawson  
Johnson, H. M. . . . . Dawson  
Jordan, L. S. . . . . Granite Falls

Kilbride, J. S. . . . . Canby  
Lee, W. N. . . . . Madison  
Lima, Ludvig. . . . . Montevideo  
Nelson, M. S. . . . . Granite Falls  
Olson, W. P. . . . . Gaylord  
Roust, H. A. . . . . Montevideo  
Smith, L. G. . . . . Montevideo  
Tangen, G. M. . . . . Canby  
Westby, Magnus. . . . . Madison  
Westby, Nels. . . . . Madison

### CLAY-BECKER COUNTY MEDICAL SOCIETY

Regular meetings, June and December  
Annual meeting, December  
Number of Members: 22

President  
Larson, Arnold. . . . . Detroit Lakes

Secretary  
Jolin, R. V. . . . . Lake Park

Aborn, W. H. . . . . Hawley  
Archibald, F. M. . . . . Mahanomen

Bergheim, M. C. . . . . Hawley  
Bottolfson, B. T. . . . . Moorhead  
Carman, J. E. . . . . Detroit Lakes  
Duncan, J. W. . . . . Moorhead  
Ellingson, A. R. . . . . Detroit Lakes  
Flancher, L. H. . . . . Lake Park  
Gosslee, G. L. . . . . Moorhead  
Hagen, O. J. . . . . Moorhead  
Haight, G. G. . . . . Audubon  
Humphrey, E. W. . . . . Moorhead

Ingebrigtsen, E. K. . . . . Moorhead  
Jolin, R. V. . . . . Lake Park  
Larsen, O. O. . . . . Detroit Lakes  
Larson, Arnold. . . . . Detroit Lakes  
Rutledge, L. H. . . . . Detroit Lakes  
Simison, C. W. . . . . Hawley  
Soine, T. S. . . . . Barnesville  
Staflne, W. A. . . . . Rochester  
Thysell, F. A. . . . . Moorhead  
Thysell, V. D. . . . . Hawley

### EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties  
Regular meetings, Quarterly  
Annual meeting, November  
Number of Members: 36

President  
Kelsey, C. G. . . . . Hinckley

Secretary  
Norrsgard, H. T. . . . . Milaca

Arends, A. L. . . . . Askov  
Blumenthal, J. S. . . . . Columbia Heights  
Bossert, C. S. . . . . Mora  
Brown, R. W. . . . . Cambridge  
Brownstone, Manuel. . . . . Sandstone  
Caley, G. R. . . . . Princeton

Callahan, F. F. . . . . Pokegama  
Cooney, H. C. . . . . Princeton  
Dedolph, T. H. . . . . Abraham  
Dredge, H. P. . . . . Sandstone  
Gates, C. E. . . . . Anoka  
Halpin, J. E. . . . . Rush City  
Hedenstrom, L. H. . . . . Cambridge  
Heseltine, V. G. . . . . Taylors Falls  
Holmes, A. E. . . . . Rush City  
Johnson, Carl E. . . . . Cambridge  
Kelsey, C. G. . . . . Hinckley  
Kling, F. L. . . . . Milaca  
Kooiker, H. J. . . . . Milaca  
McBroom, D. E. . . . . Cambridge  
Nethercott, E. G. . . . . Pine City

Nordman, W. F. . . . . Mora  
Norrsgard, H. T. . . . . Milaca  
Pearson, Bjarne. . . . . Taylors Falls  
Peterson, A. A. . . . . Mora  
Phelps, A. G. . . . . St. Paul  
Rochke, A. B. . . . . Elk River  
Schlesselman, George. . . . . Anoka  
Spurzem, R. J. . . . . Anoka  
Stephen, E. L. . . . . Hinckley  
Stratte, A. K. . . . . Pine City  
Swensen, R. G. . . . . Harris  
Truog, C. P. . . . . Lindstrom  
Vik, Melvin. . . . . Onamia  
Wahlberg, E. W. . . . . Isle  
Zeien, Thomas. . . . . North Branch



# ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

## FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly  
Annual meeting, December  
Number of Members: 19

President  
Kaasa, L. J. . . . . Albert Lea  
  
Secretary  
Gamble, P. M. . . . . Albert Lea  
  
Burns, H. D. . . . . Albert Lea  
Butturff, C. R. . . . . Freeborn

Calhoun, F. W. . . . . Albert Lea  
Folken, F. G. . . . . Albert Lea  
Freeman, J. P. . . . . Albert Lea  
Freligh, W. P. . . . . Albert Lea  
Gamble, J. W. . . . . Albert Lea  
Gamble, P. M. . . . . Albert Lea  
Gullixson, A. . . . . Albert Lea  
Kaasa, L. J. . . . . Albert Lea  
Kamp, B. A. . . . . Albert Lea

Leopard, B. A. . . . . Albert Lea  
Manley, L. V. . . . . Albert Lea  
Merritt, W. A. . . . . Albert Lea  
Palmer, C. F. . . . . Albert Lea  
Palmer, W. L. . . . . Albert Lea  
Schultz, J. A. . . . . Albert Lea  
Trombley, R. A. . . . . Emmons  
Whitson, S. A. . . . . Alden

## GOODHUE COUNTY MEDICAL SOCIETY

Regular meetings, none  
Annual meeting, December  
Number of Members: 19

President  
Vaaler, Thorwald. . . . . Cannon Falls  
  
Secretary  
Steffens, L. A. . . . . Red Wing  
  
Aanes, A. M. . . . . Red Wing  
Anderson, S. H. . . . . Red Wing

Brusegard, J. F. . . . . Red Wing  
Claydon, D. R. . . . . Red Wing  
Claydon, H. F. . . . . Zumbrota  
Claydon, L. E. . . . . Red Wing  
Cremer, P. H. . . . . Hastings  
Hedin, R. F. . . . . Red Wing  
Johnson, A. E. . . . . Red Wing  
Jones, A. W. . . . . Red Wing  
Juers, E. H. . . . . Red Wing

Liffbrig, W. W. . . . . Goodhue  
Mack, J. J. . . . . Fordyce, Arkansas  
McGuigan, H. T. . . . . Red Wing  
Miller, F. J. . . . . Fort Snelling  
Smith, M. W. . . . . Red Wing  
Steffens, L. A. . . . . Red Wing  
Vaaler, T. . . . . Cannon Falls  
Williams, M. R. . . . . Cannon Falls

## HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, First Monday Each Month  
Annual meeting, October  
Number of Members: 556

President  
Hayes, J. M. . . . . Minneapolis  
  
Secretary  
Campbell, O. J. . . . . Minneapolis

Ahrens, R. S. . . . . Minneapolis  
Alexander, H. A. . . . . Minneapolis  
Aling, C. A. . . . . Minneapolis  
Allen, H. W. . . . . Minneapolis  
Allison, R. G. . . . . Minneapolis  
Altnow, H. O. . . . . Minneapolis  
Andersen, A. G. . . . . Minneapolis  
Andersen, S. C. . . . . Minneapolis  
Anderson, D. D. . . . . Minneapolis  
Anderson, E. D. . . . . Minneapolis  
Anderson, E. R. . . . . Minneapolis  
Anderson, F. J. . . . . Minneapolis  
Anderson, J. K. . . . . Minneapolis  
Anderson, K. W. . . . . Minneapolis  
Anderson, P. A. . . . . Minneapolis  
Anderson, U. S. . . . . Minneapolis  
Andreassen, E. C. . . . . Minneapolis  
Annis, H. B. . . . . Minneapolis  
Arey, S. L. . . . . Excelsior  
Arlander, C. E. . . . . Minneapolis  
Arnold, D. C. . . . . Minneapolis  
Arvidson, C. G. . . . . Minneapolis  
Aune, Martin. . . . . Minneapolis  
Aurand, W. H. . . . . Minneapolis  
Avery, J. F. . . . . Minneapolis  
Baken, M. P. . . . . Minneapolis  
Baker, A. T. . . . . Minneapolis  
Baker, E. L. . . . . Minneapolis  
Baker, Loe. . . . . Minneapolis  
Barber, J. P. . . . . Minneapolis  
Barron, Moses. . . . . Minneapolis  
Bass, G. W. . . . . Minneapolis  
Baxter, S. H. . . . . Minneapolis  
Bayard, H. F. . . . . Minneapolis  
Beard, A. H. . . . . Minneapolis  
Beard, R. O. . . . . Minneapolis  
Beckman, W. G. . . . . Minneapolis  
Bedford, E. W. . . . . Minneapolis  
Bell, E. T. . . . . Minneapolis  
Benjamin, A. E. . . . . Minneapolis  
Benjamin, E. G. . . . . Minneapolis  
Benn, F. G. . . . . Minneapolis  
Berger, A. G. . . . . Minneapolis  
Berkwitz, N. J. . . . . Minneapolis  
Bessens, A. N. Jr. . . . . Minneapolis  
Bessens, D. H. . . . . Minneapolis  
Bessens, W. A. . . . . Minneapolis  
Blake, James. . . . . Hopkins  
Bockman, M. W. H. . . . . Minneapolis  
Boies, L. R. . . . . Minneapolis  
Booth, A. E. . . . . Minneapolis  
Boreen, C. A. . . . . Minneapolis  
Borreson, E. J. . . . . Minneapolis  
Boutman, H. A. H. . . . . Minneapolis  
Boynton, Ruth. . . . . Minneapolis  
Bracken, H. M. . . . . Claremont, Calif.  
Bratrud, A. F. . . . . Minneapolis  
Brooks, C. N. . . . . Minneapolis  
Brown, E. D. . . . . Minneapolis

Brown, E. J. . . . . Minneapolis  
Bryant, O. R. . . . . Minneapolis  
Bulkley, Kenneth. . . . . Minneapolis  
Bullard, Mattie J. . . . . Minneapolis  
Butler, John. . . . . Minneapolis  
Buzzelle, L. K. . . . . Minneapolis  
Cable, M. L. . . . . Minneapolis  
Cabot, G. S. . . . . Minneapolis  
Cabot, V. S. . . . . Minneapolis  
Cady, L. H. . . . . Minneapolis  
Callierstrom, G. W. . . . . Minneapolis  
Cameron, Isabell. . . . . Minneapolis  
Camp, W. E. . . . . Minneapolis  
Campbell, L. M. . . . . Minneapolis  
Campbell, O. J. . . . . Minneapolis  
Cardle, A. E. . . . . Minneapolis  
Carey, J. B. . . . . Minneapolis  
Carlaw, C. M. . . . . Minneapolis  
Carlson, H. A. . . . . Minneapolis  
Caron, R. P. . . . . Minneapolis  
Cavanor, F. T. . . . . Minneapolis  
Cherry, C. H. . . . . Minneapolis  
Chesley, A. J. . . . . Minneapolis  
Christenson, C. R. . . . . Minneapolis  
Christianson, H. W. . . . . Minneapolis  
Clark, H. S. . . . . Minneapolis  
Cohen, S. S. . . . . Oak Terrace  
Condit, W. H. . . . . Minneapolis  
Cook, H. W. . . . . Minneapolis  
Cooperman, H. O. . . . . Minneapolis  
Corbett, J. F. . . . . Minneapolis  
Cornica, A. D. . . . . Minneapolis  
Cosman, E. O. . . . . Minneapolis  
Cottam, G. . . . . Minneapolis  
Crafts, L. M. . . . . Minneapolis  
Cranmer, R. R. . . . . Minneapolis  
Cranston, R. W. . . . . St. Louis Park  
Creedy, C. D. . . . . Minneapolis  
Curtin, J. F. . . . . Minneapolis  
Cutts, George. . . . . Minneapolis  
Cutts, R. E. . . . . Minneapolis  
Dady, E. E. . . . . Minneapolis  
Dahl, E. O. . . . . Minneapolis  
Dahl, J. A. . . . . Minneapolis  
Daniel, D. H. . . . . Minneapolis  
Daniel, L. M. . . . . Minneapolis  
Dart, L. O. . . . . Minneapolis  
Davis, J. C. . . . . Minneapolis  
del Plaine, C. W. . . . . Minneapolis  
Devereaux, T. J. . . . . Wayzata  
Diehl, H. S. . . . . Minneapolis  
Diessner, H. D. . . . . Minneapolis  
Donaldson, C. A. . . . . Mesa, Arizona  
Dorge, R. L. . . . . Minneapolis  
Dornblaser, H. B. . . . . Minneapolis  
Dorsey, G. C. . . . . Minneapolis  
Doxey, G. L. . . . . Minneapolis  
Doyle, L. O. . . . . Minneapolis  
Drake, C. R. . . . . Minneapolis  
Drill, H. E. . . . . Hopkins  
Duff, E. R. . . . . Minneapolis  
Dumas, A. G. . . . . Minneapolis  
Dunlap, E. H. . . . . Minneapolis  
Dunn, G. R. . . . . Minneapolis  
Duryea, Marhry. . . . . Minneapolis  
Duryea, W. M. . . . . Minneapolis  
Dutton, C. E. . . . . Minneapolis

Dvorak, B. A. . . . . Minneapolis  
Dwan, P. F. . . . . Minneapolis  
Dworsky, S. D. . . . . Minneapolis  
Ehrenberg, C. J. . . . . Minneapolis  
Ehrlich, S. P. . . . . Minneapolis  
Eich, Matthew. . . . . Minneapolis  
Eisenstadt, D. H. . . . . Minneapolis  
Eitel, G. D. . . . . Minneapolis  
Ellison, D. E. . . . . Minneapolis  
Engstrand, O. J. . . . . Minneapolis  
Erb, F. A. . . . . Minneapolis  
Erdmann, C. A. . . . . Minneapolis  
Erickson, R. F. . . . . Minneapolis  
Ericson, R. M. . . . . Minneapolis  
Evans, E. T. . . . . Minneapolis  
Evans, R. D. . . . . Minneapolis  
Exley, E. W. F. . . . . Minneapolis  
Fahr, G. E. . . . . Minneapolis  
Fansler, W. A. . . . . Minneapolis  
Fasbender, H. A. . . . . Hastings  
Feeney, J. M. . . . . Minneapolis  
Fenger, E. P. K. . . . . Minneapolis  
Fetterly, Warren. . . . . Minneapolis  
Fink, L. W. . . . . Minneapolis  
Fink, W. H. . . . . Minneapolis  
Fitzgerald, D. F. . . . . Minneapolis  
Fjeldstad, C. A. . . . . Minneapolis  
Ford, W. H. . . . . Minneapolis  
Foster, W. K. . . . . Minneapolis  
Fowler, L. H. . . . . Minneapolis  
Frery, Louise G. . . . . Minneapolis  
Fredericks, G. M. . . . . Minneapolis  
Friedell, Aaron. . . . . Minneapolis  
Froehlich, H. W. . . . . Minneapolis  
Funk, V. K. . . . . Oak Terrace  
Gammell, J. H. . . . . Minneapolis  
Gardner, E. L. . . . . Minneapolis  
Giere, E. O. . . . . Minneapolis  
Giere, J. C. . . . . Minneapolis  
Giere, R. W. . . . . Minneapolis  
Gjessler, P. W. . . . . Minneapolis  
Gilles, F. L. . . . . Minneapolis  
Gingold, B. A. . . . . Minneapolis  
Gratzek, F. R. . . . . Minneapolis  
Grave, Floyd. . . . . Minneapolis  
Gray, R. C. . . . . Minneapolis  
Green, E. K. . . . . Minneapolis  
Greene, W. P. . . . . Minneapolis  
Greisheimer, Esther M. . . . . Minneapolis  
Grimes, Marian. . . . . Minneapolis  
Gronvall, P. R. . . . . Minneapolis  
Gunderson, N. A. . . . . Minneapolis  
Gustason, H. T. . . . . Minneapolis  
Hacking, F. H. . . . . Minneapolis  
Hagen, G. L. . . . . Minneapolis  
Haggard, G. D. . . . . Minneapolis  
Hall, J. M. . . . . Minneapolis  
Hallberg, C. A. . . . . Minneapolis  
Hamel, A. L. . . . . Minneapolis  
Hamilton, A. S. . . . . Minneapolis  
Hamlin, G. B. . . . . Minneapolis  
Hand, R. O. . . . . Minneapolis  
Hannah, H. B. . . . . Minneapolis  
Hansen, E. W. . . . . Minneapolis  
Hansen, Olga S. . . . . Minneapolis  
Hanson, H. J. . . . . Minneapolis  
Hanson, H. V. . . . . Minneapolis

# ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

Hanson, W. A.	Minneapolis	Linner, H. P.	Minneapolis	Peterson, W. H.	Minneapolis
Harrington, C. D.	Minneapolis	Linton, W. B.	Minneapolis	Petit, L. J.	Minneapolis
Harrington, F. E.	Minneapolis	Lipschultz, Oscar.	Minneapolis	Pettit, C. K.	Oak Terrace
Harrison, W. C.	Minneapolis	Litman, A. B.	Minneapolis	Pettit, C. K.	Minneapolis
Hart, V. L.	Minneapolis	Litzenberg, J. C.	Minneapolis	Peyton, W. T.	Minneapolis
Hartzell, T. B.	Minneapolis	Logeheil, R. C.	Minneapolis	Pfunder, M. C.	Minneapolis
Hastings, D. R.	Minneapolis	Long, Jesse.	Minneapolis	Phelps, K. A.	Minneapolis
Haugen, J. A.	Minneapolis	Loomis, E. A.	Minneapolis	Platou, E. S.	Minneapolis
Haverfield, Addie R.	Minneapolis	Lundblad, R. A.	Minneapolis	Pollard, D. W.	Minneapolis
Hawkinson, R. P.	Robbinsdale	Lundgren, A. C.	Minneapolis	Pollock, D. K.	Minneapolis
Hayes, J. M.	Minneapolis	Lundquist, E. F.	Minneapolis	Polzak, J. A.	Minneapolis
Head, D. P.	Minneapolis	Lynch, M. J.	Minneapolis	Pratt, F. J.	Minneapolis
Head, G. D.	Minneapolis	Lyon, E. P.	Minneapolis	Preine, J. A.	Minneapolis
Hedback, A. E.	Minneapolis	Lysne, Henry.	Minneapolis	Prim, J. A.	Minneapolis
Helk, H. H.	Minneapolis	MacDonald, A. E.	Minneapolis	Proshak, C. E.	Minneapolis
Hendrickson, J. F.	Minneapolis	MacDonald, D. A.	Minneapolis	Quinby, T. F.	Minneapolis
Henrikson, E. C.	Minneapolis	MacDonald, I. C.	Minneapolis	Quist, H. W.	Minneapolis
Henry, C. E.	Minneapolis	Mach, F. B.	Minneapolis	Rasmussen, R. C.	St. Paul
Henry, M. O.	Minneapolis	Macnie, J. S.	Minneapolis	Reed, C. A.	Minneapolis
Herbolsheimer, A. J.	Minneapolis	Maland, C. O.	Minneapolis	Regnier, E. A.	Minneapolis
Herman, A. L.	Minneapolis	*Mann, A. T.	Minneapolis	Reimann, H. A.	Minneapolis
Hesdorffer, M. B.	Minneapolis	Marley, W. J.	Minneapolis	Rice, C. O.	Minneapolis
Hiebert, J. E.	Minneapolis	Mariette, E. S.	Oak Terrace	Richardson, F. S.	Minneapolis
Higgins, J. H.	Minneapolis	Mark, D. B.	Minneapolis	Richdorf, L. F.	Minneapolis
Hill, Eleanor J.	Minneapolis	Martinson, C. J.	Wayzata	Ricke, W. W.	Wayzata
Hirschfelder, A. D.	Minneapolis	Matchan, G. R.	Minneapolis	Rigler, L. G.	Minneapolis
Hirshfield, F. R.	Minneapolis	Matthews, Justus.	Minneapolis	Rishmiller, J. H.	Minneapolis
Hoaglund, A. W.	Minneapolis	Mattill, P. M.	Oak Terrace	Rizer, R. J.	Minneapolis
Hobbs, C. A.	Minneapolis	Mattson, Hamlin.	Minneapolis	Roan, C. M.	Minneapolis
Hodge, S. V.	Minneapolis	May, W. H.	Minneapolis	Robb, E. F.	Minneapolis
Hoffert, H. E.	Minneapolis	Maxeiner, S. R.	Minneapolis	Roberts, T. S.	Minneapolis
Holl, P. M.	Minneapolis	McCarthy, Donald.	Minneapolis	Roberts, W. C.	Minneapolis
Holt, W. B.	Minneapolis	McCartney, J. A.	Minneapolis	Robitsek, E. C.	Minneapolis
Howard, W. H.	Minneapolis	McDaniel, Oriana.	Minneapolis	Rochford, W. E.	Minneapolis
Huenekens, E. J.	Minneapolis	*McEachran, A.	Minneapolis	Rodda, F. C.	Minneapolis
Hughes, L. D.	Minneapolis	McFarland, A. H.	Minneapolis	Rodgers, C. L.	Minneapolis
Hultkrans, R. E.	Minneapolis	McGandy, R. F.	Minneapolis	Rosen, Samuel.	Minneapolis
Hurd, Annah.	Minneapolis	McGeary, G. E.	Minneapolis	Rosenwald, R. M.	Minneapolis
Husband, M. W.	Minneapolis	McInerney, Maurice.	Minneapolis	Rucker, C. W.	Minneapolis
Hutchinson, C. J.	Minneapolis	McIntyre, George.	Minneapolis	Rucker, W. H.	Minneapolis
Hymes, Charles.	Minneapolis	McKinlay, C. A.	Minneapolis	Rud, N. E.	Minneapolis
Hynea, J. E.	Minneapolis	McKinley, J. C.	Minneapolis	Rudell, G. L.	Minneapolis
Irvine, H. G.	Minneapolis	McKinney, F. S.	Minneapolis	Rupp, Alice.	Minneapolis
Irwin, A. P.	Minneapolis	McPeeters, H. O.	Minneapolis	Russeth, A. N.	Minneapolis
Jackson, C. M.	Minneapolis	McQuarrie, Irvine.	Minneapolis	Rusten, E. M.	Minneapolis
Jennings, F. L.	Oak Terrace	Medelman, J. P.	Minneapolis	Sadler, W. P.	Minneapolis
Jennings, Mary H.	Minneapolis	Mee, P. H.	Osseo	St. Cyr, K. J.	Osseo
Jensen, Harry.	Minneapolis	Meland, E. L.	Minneapolis	Salt, C. G.	Minneapolis
Jensen, M. J.	Minneapolis	Merkert, C. E.	Minneapolis	Samuelson, Samuel.	Minneapolis
Johnson, A. B.	Minneapolis	Merkert, G. L.	Minneapolis	Sawatzky, W. A.	Minneapolis
Johnson, A. E.	Minneapolis	Merrill, Elisabeth.	Minneapolis	Schaff, F. H. K.	Minneapolis
Johnson, H. A.	Minneapolis	Meyer, E. L.	Minneapolis	Schaefer, W. G.	Minneapolis
Johnson, J. A.	Minneapolis	Michael, J. C.	Minneapolis	Scheldrup, N. H.	Minneapolis
Johnson, Julius.	Minneapolis	Michelson, H. E.	Minneapolis	Schmitt, A. F.	Minneapolis
Johnson, N. A.	Minneapolis	Miller, H. E.	Minneapolis	Schmitt, S. C.	Minneapolis
Johnson, Norman.	Minneapolis	Miller, J. C.	Minneapolis	Schneider, J. P.	Minneapolis
Johnson, R. A.	Minneapolis	Milton, J. S.	Minneapolis	Schottler, M. E.	Minneapolis
Johnson, S. M.	Minneapolis	Moe, J. H.	Minneapolis	Schultz, P. J.	Minneapolis
Johnson, Y. T.	Minneapolis	Moir, W. W.	Minneapolis	Schussler, O. F.	Minneapolis
Johnston, L. F.	Minneapolis	Moorhead, M. B.	Minneapolis	Schwartz, V. J.	Minneapolis
Jones, G. M.	Minneapolis	Moren, Edward.	Minneapolis	Schwytzer, Gustav.	Minneapolis
Jones, H. W.	Minneapolis	Moriarty, Cecile R.	Minneapolis	Scott, F. H.	Minneapolis
Jones, W. W.	Minneapolis	Morrison, A. W.	Minneapolis	Scott, H. G.	Minneapolis
Josewich, Alexander.	Minneapolis	Morse, R. W.	Minneapolis	Seashore, Gilbert.	Minneapolis
Kalin, O. T.	Minneapolis	Morton, H. McI.	Vincetown, N. J.	Scham, Max.	Minneapolis
Kelby, G. M.	Minneapolis	Murphy, I. J.	Minneapolis	Seifert, M. H.	Excelsior
Kennedy, C. C.	Minneapolis	Murphy, Leo.	Minneapolis	Sellesteth, I. F.	Minneapolis
Kennedy, Jane F.	Minneapolis	Myers, J. A.	Minneapolis	Simons, J. H.	Minneapolis
Kennedy, R. R.	Minneapolis	Nathanson, M. H.	Minneapolis	Simpson, E. D.	Minneapolis
Kertesz, G.	Minneapolis	Neal, J. M.	Minneapolis	Siperstein, D. M.	Minneapolis
Kibbe, O. A.	Minneapolis	Neilson, H. F.	Minneapolis	Sitar, R. F.	Minneapolis
King, E. A.	Minneapolis	Nelson, H. S.	Minneapolis	Sivertsen, Ivar.	Minneapolis
King, H. T.	Minneapolis	Nelson, Harvey.	Minneapolis	Skjold, A. C.	Minneapolis
Kinsella, T. J.	Oak Terrace	Nelson, O. E.	Minneapolis	Smith, A. E.	Minneapolis
Kistler, A. J.	Minneapolis	Newhart, Horace.	Minneapolis	Smith, A. M.	Minneapolis
Kistler, C. M.	Minneapolis	Nordin, G. T.	Minneapolis	Smith, H. R.	Minneapolis
Knapp, M. E.	Minneapolis	Nordland, Martin.	Minneapolis	Smith, N. M.	Minneapolis
Knight, R. R.	Minneapolis	Noth, H. W.	Minneapolis	Soderlind, R. T.	Minneapolis
Knight, R. T.	Minneapolis	Nystrom, Ruth.	Minneapolis	Solhaug, S. B.	Minneapolis
Koepcke, G. M.	Minneapolis	Oberg, C. M.	Minneapolis	Spano, J. P.	Minneapolis
Koller, H. M.	Minneapolis	O'Brien, W. A.	Minneapolis	Spratt, C. N.	Minneapolis
Koller, L. R.	Minneapolis	O'Donnell, J. E.	Minneapolis	Stelter, L. A.	Minneapolis
Kucera, F. J.	Hopkins	Olson, A.	Minneapolis	Stenstrom, Annette T.	Minneapolis
Kucera, W. A.	Minneapolis	Olson, O.	Minneapolis	Stewart, C. A.	Minneapolis
Lajoie, J. M.	Minneapolis	Olson, R. G.	Minneapolis	Stewart, R. I.	Minneapolis
Lapierre, A. P.	Minneapolis	Oppen, E. G.	Minneapolis	Stomel, Joseph.	Minneapolis
Lapierre, C. A.	Minneapolis	Owre, Oscar.	Minneapolis	Strachauer, A. C.	Minneapolis
Lapierre, J. T.	Minneapolis	Parks, A. H.	Minneapolis	Strout, E. S.	Minneapolis
Larsen, F. W.	Minneapolis	Patterson, W. E.	Minneapolis	Strout, G. E.	Minneapolis
Larson, C. M.	Minneapolis	Paul, Louise Mary.	Minneapolis	Sturte, J. R.	Minneapolis
Larson, L. M.	Minneapolis	Paulsen, E. L.	Minneapolis	Sundt, Mathias.	Minneapolis
Larson, P. N.	Minneapolis	*Pederson, Harold.	Minneapolis	Swanson, Cephas.	Minneapolis
Laurent, A. A.	Minneapolis	Pederson, R. M.	Minneapolis	Swanson, R. E.	Minneapolis
LaVake, R. L.	Minneapolis	Pennington, Reuben.	Minneapolis	Sweetser, H. B., Jr.	Minneapolis
Lazar, H. L.	Minneapolis	Peppard, T. A.	Minneapolis	Sweetser, H. B., Sr.	Minneapolis
Leavitt, H. H.	Minneapolis	Perry, R. St. J.	Minneapolis	Sweetser, T. H.	Minneapolis
Lebowski, J. A.	Minneapolis	Petersen, J. R.	Minneapolis	Sweetser, S. E.	Minneapolis
Lee, H. M.	Minneapolis	Petersen, Thorvald.	Minneapolis	Swendseen, C. G.	Minneapolis
Leland, H. R.	Minneapolis	Peterson, H. W.	Minneapolis	*Tanner, A. C.	Minneapolis
Lenz, O. A.	Minneapolis	Peterson, N. P.	Minneapolis	Terntstrom, O. H.	Minneapolis
Levine, N. M.	Minneapolis	Peterson, O. H.	Minneapolis	Thomas, G. E.	Minneapolis
Lillehei, E. J.	Robbinsdale	Peterson, P. E.	Minneapolis	Thomas, G. J.	Minneapolis
Lind, C. J.	Minneapolis	Peterson, W. C.	Minneapolis	Trueman, H. S.	Minneapolis
Lindquist, R. H.	Minneapolis				

## ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

Tunstead, H. J.	Minneapolis	Webb, R. C.	Minneapolis	Winther, Nora M. C.	Minneapolis
Turnachiff, D. D.	Minneapolis	Weisman, S. A.	Minneapolis	Witham, C. A.	Minneapolis
Tyrell, C. C.	Minneapolis	Westman, R. T.	Minneapolis	Wittich, F. W.	Minneapolis
Ude, W. H.	Minneapolis	Wethall, A. G.	Minneapolis	Wohlrahe, A. A.	Minneapolis
Ulrich, H. L.	Minneapolis	Wetherby, Macnider.	Minneapolis	Wohlrahe, C. F.	Minneapolis
Undine, C. A.	Minneapolis	Weum, T. W.	Minneapolis	Wood, D. F.	Minneapolis
Urner, J. A.	Minneapolis	White, S. M.	Minneapolis	Woodworth, Elizabeth.	Minneapolis
Voyer, Emile O.	Minneapolis	Widen, W. F.	Minneapolis	Wright, C. B.	Minneapolis
Wahlquist, H. F.	Minneapolis	Wiese, H. F. B.	Minneapolis	Wright, C. D.	Minneapolis
Waldron, C. W.	Minneapolis	Wilcox, A. E.	Minneapolis	Wright, F. R.	Minneapolis
Wall, C. R.	Minneapolis	Wildner, R. L.	Minneapolis	Wyatt, O. S.	Minneapolis
Wangsten, O. H.	Minneapolis	Wilken, P. A.	Minneapolis	Wynne, H. M. N.	Minneapolis
Wanous, E. Z.	Minneapolis	Wilkerson, V. A.	Washington, D. C.	Ylvisaker, R. S.	Minneapolis
Ward, A. W.	Minneapolis	Willcutt, C. E.	Minneapolis	Yoerg, O. W.	Minneapolis
Ward, P. A.	Minneapolis	Williams, Robert.	Minneapolis	Zaworski, E. A.	Minneapolis
Warham, T. T.	Minneapolis	Wilson, V. A.	Minneapolis	Zierold, A. A.	Minneapolis
Watson, J. A.	Minneapolis	Winer, L. H.	Minneapolis	Ziskin, Thomas.	Minneapolis

### KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, Second Thursday of Month  
Annual meeting, December  
Number of Members: 31

President		Brigham, Frank.	Watkins	Hodapp, R. J.	Willmar
Behmler, F. W.		Daignault, Oscar	Benson	Hutchinson, Henry.	Willmar
Secretary		Danielson, K. A.	Litchfield	Jacobs, J. C.	Willmar
		Danielson, Lennox.	Litchfield	Jensen, H. H.	Atwater
Scofield, C. L.		Dowswell, W. J.	Kerkhoven	Johnson, Hans.	Kerkhoven
Anderson, R. E.		Dulude, S. S.	Dassel	Kaufman, W. C.	Appleton
		Edwards, G. C.	Grove City	Macklin, W. E., Jr.	Litchfield
Arnos, J. M.		Fiksdal, M. J.	Willmar	O'Connor, D. C.	Eden Valley
Behmler, F. W.		Fredrickson, Alice C.	Lake Lillian	Rains, J. M.	Willmar
Branton, A. F.		Fredrickson, G. U. Y.	Lake Lillian	Ripple, R. J.	New London
Branton, B. J.		Frisch, F. P.	Willmar	Scofield, C. L.	Benson
		Frost, E. H.	Willmar	Telford, V. J.	Litchfield
		Giere, S. W.	Benson	Wilmot, H. E.	Litchfield

### LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, First Tuesday of Month  
Annual meeting, October  
Number of Members: 22

President		Ford, B. C.	Marshall	Persons, C. E.	Marshall
Happe, L. J.		Germo, Charles.	Balaton	Purves, G. H.	Russell
Secretary		Golden, C. M.	Tyler	Robertson, J. B.	Cottonwood
		Gray, F. D.	Marshall	Sanderson, E. T.	Minnetoa
Workman, H. M.		Happe, L. J.	Marshall	Thordarson, Theodore.	Minnetoa
Akester, Ward.		Hermanson, P. E.	Hendricks	Vadheim, A. L.	Tyler
		Hoidale, A. D.	Tracy	Valentine, W. H.	Tracy
Bosingham, O. N.		Jacquot, G. L.	Marshall	Workman, H. M.	Tracy
		Monson, L. J.	Hendricks	Workman, W. G.	Tracy
		Nilson, H. J.	North Mankato	Yaeger, W. W.	Ivanhoe

### MCLEOD COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly or at call of President  
Annual meeting, January or February  
Number of Members: 18

President		Fine, B. A.	Winsted	Rempel, D. D.	Brownston
Lippmann, E. W.		Holm, H. H.	Glencoe	Sahr, W. G.	Hutchinson
Secretary		Jensen, A. H.	Hutchinson	Schmidt, W. R.	Glencoe
		Klima, W. W.	Stewart	Scholpp, O. W.	Hutchinson
Fine, B. A.		Langhoff, A. H.	Glencoe	Sheppard, Fred.	Hutchinson
Clement, J. B.		Lippmann, E. W.	Hutchinson	Sheppard, P. E.	Hutchinson
Crow, E. R.		McMahon, M. I.	Green Isle	Tinker, C. W.	Stewart
		Ninneman, N. N.	Silver Lake	Trutna, T. J.	Silver Lake

### MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday each Month, except June, July and August  
Annual meeting, last Thursday in November  
Number of Members: 23

President		Flanagan, L. G.	Austin	McKenna, J. K.	Austin
Hegge, O. H.		Greene, H. H.	Austin	Melzer, G. R.	Lyle
Secretary		Grise, W. B.	Austin	Mitchell, R. S.	Grand Meadow
		Havens, J. G. W.	Austin	Morrow, J. I.	Austin
Robertson, P. A.		Hegge, O. H.	Austin	Morse, M. P.	LeRoy
Allen, A. W.		Hegge, R. S.	Austin	Rehman, E. C.	Austin
		Henslin, A. E.	Le Roy	Robertson, P. A.	Austin
Allen, C. C.		Hertel, G. E.	Austin	Schottler, G. J.	Dexter
Crowell, B. J.		Leck, P. C.	Austin	Shеды, C. L.	Austin
		Lommen, P. A.	Austin	Thomson, J. M.	Brownsdale

### NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, January, April, Summer, October  
Annual meeting, January  
Number of Members: 17

President		Covell, W. W.	St. Peter	Kolars, J. J.	Le Center
Wolner, O. H.		Curtis, R. A.	Le Center	Lenander, M. E.	St. Peter
Secretary		Ericson, Swan.	Le Sueur	McKeon, J. O.	Montgomery
		Freeman, G. H.	St. Peter	Petersen, M. C.	St. Peter
Ericson, Swan.		Gully, R. J.	St. Peter	Sonnesyn, N. N.	Le Sueur
Aitkens, H. B.		Hiniker, P. J.	Le Sueur	Strathern, F. P.	St. Peter
		Holtan, Theodore.	Waterville	Traxler, F. J.	Henderson
		Kerschbaumer, Louisa.	St. Peter	Wolner, O. H.	St. Peter

# ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

## OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Regular meetings, First Wednesday Every Odd Month

Annual meeting, First Wednesday in November

Number of Members: 289

President		Foster, R. F.	Rochester	Nehring, J. P.	Preston
Secretary		Fricke, R. E.	Rochester	Nettrour, W. S.	Rochester
Snell, A. M.	Rochester	Gaarde, F. W.	Rochester	New, G. B.	Rochester
Treasurer		Garling, L. C.	Rochester	Ochsner, H. C.	Rochester
Piper, M. C.	Rochester	Ghormley, R. K.	Rochester	Odel, H. M.	Rochester
Adson, A. W.	Rochester	Giffin, H. Z.	Rochester	O'Leary, P. A.	Rochester
Affeldt, D. E.	Kasson	Gillespie, D. L.	Rochester	Olson, E. A.	Pine Island
Albers, E. C.	Champaign, Ill.	Gilpin, S. F., Jr.	Rochester	Olson, G. E.	West Concord
Allen, E. W.	Rochester	Goldsmith, Grace A.	Rochester	Olson, P. F.	Rochester
Alvarez, W. C.	Rochester	Goodwin, T. W.	Rochester	O'Neal, B. L.	Rochester
Amberg, Samuel	Rochester	Gray, H. K.	Rochester	Onsgard, L. K., Jr.	Houston
Anderson, C. M.	Rochester	Griffin, A. M.	Rochester	Onsgard, L. K., Sr.	Houston
Anderson, C. R.	Rochester	Guthrie, I. S.	Rochester	Overton, L. M.	Rochester
Anderson, M. J.	Rochester	Habein, H. C.	Rochester	Pace, J. McL.	Rochester
Anderson, N. E.	Harmony	Haines, S. F.	Rochester	Parker, R. L.	Rochester
Bailey, R. J.	Rochester	Hale, D. E.	Rochester	Parkhill, Edith M.	Rochester
Baker, C. P.	Rochester	Hallenbeck, D. F.	Rochester	Pemberton, J. deJ.	Rochester
Baker, H. R.	Hayfield	Hamilton, W. S.	Cincinnati, Ohio	Peterson, D. L.	Rochester
Baker, T. W.	Rochester	Hardwick, R. S.	Rochester	Pilcher, Frederick, Jr.	Rochester
Bair, H. L.	Rochester	Harrington, S. W.	Rochester	Piper, M. C.	Rochester
Balfour, D. C.	Rochester	Hartman, H. R.	Rochester	Plummer, H. S.	Rochester
Bannick, E. G.	Rochester	Havens, F. W.	Rochester	Plummer, W. A.	Rochester
Bargen, J. A.	Rochester	Hebert, W. H. J.	Rochester	Pollock, L. W.	Rochester
Barker, N. W.	Rochester	Heck, F. J.	Rochester	Popp, W. C.	Rochester
Barnes, A. R.	Rochester	Heilman, F. R.	Rochester	Porter, G. L.	Rochester
Beaver, D. C.	Rochester	Helland, G. M.	Spring Grove	Prangen, A. D.	Rochester
Bedard, R. E.	Rochester	Helland, J. W.	Spring Grove	Prickman, L. E.	Rochester
Beiswanger, R. H.	Wykoff	Helmholz, H. F.	Rochester	Priestley, J. T.	Rochester
Belote, G. B.	Caledonia	Hempstead, B. E.	Rochester	Raaf, J. E.	Rochester
Benedict, W. I.	Rochester	Hench, P. S.	Rochester	Randall, L. B.	Rochester
Berkman, D. M.	Rochester	Henderson, M. S.	Rochester	Rivers, A. M.	Rochester
Berkman, J. M.	Rochester	Herrell, W. E.	Rochester	Robertson, H. E.	Rochester
Betlach, C. J.	Rochester	Hertzog, A. J.	Rochester	Robins, C. R., Jr.	Richmond, Va.
Bigelow, C. E.	Dodge Center	Hewitt, Edith S.	Rochester	Robinson, L. W.	Denver, Colo.
Binger, M. W.	Rochester	Hewitt, R. M.	Rochester	Robinson, V. C.	Rochester
Blake, T. W.	Rochester	Heyerdale, O. C.	Rochester	Rosenow, E. C.	Rochester
Blum, B. B.	Rochester	Hines, E. A., Jr.	Rochester	Ryneanson, E. H.	Rochester
Boothby, W. M.	Rochester	Hinshaw, H. C.	Rochester	Sanford, A. H.	Rochester
Bowling, H. H.	Rochester	Hoerner, M. T.	Rochester	Sanford, H. S.	Rochester
Braasch, W. F.	Rochester	Horton, B. T.	Rochester	Saunders, T. S., Jr.	Rochester
Brink, J. R.	Rochester	Howell, L. P.	Rochester	Scherer, R. G.	Dubuque, Iowa
Brodgers, A. C.	Rochester	Hubby, J. W.	Rochester	Schmidt, H. W.	Rochester
Brown, A. E.	Rochester	Hunt, A. B.	Rochester	Schulhof, M. G.	Rochester
Brown, G. E.	Rochester	Johnson, R. B.	Lanesboro	Sheldon, W. D.	Rochester
Brown, P. W.	Rochester	Jones, H. M.	Rochester	Shoemaker, Rosemary	Rochester
Brunsting, L. A.	Rochester	Joyce, G. T.	Rochester	Slavens, J. J.	Toronto, Canada
Brust, J. C. M.	Syracuse, N. Y.	Judd, E. S.	Rochester	Sloumb, C. H.	Rochester
Buchtel, H. A.	Rochester	Keith, N. M.	Rochester	Smith, B. F.	Rochester
Buie, L. A.	Rochester	Kennedy, R. L. J.	Rochester	Smith, F. L.	Kasson
Burch, H. A.	Rochester	Kepler, E. J.	Rochester	Smith, F. L.	Rochester
Butsch, W. L.	Rochester	Kernohan, J. W.	Rochester	Smith, H. L.	Rochester
Butt, H. R.	Rochester	Kirklin, B. R.	Rochester	Smith, N. D.	Rochester
Cabot, C. M.	Rochester	Kirklin, O. L.	Rochester	Snell, A. M.	Rochester
Cabot, Hugh	Rochester	Knepper, P. A.	Rochester	Stacy, L. J.	Rochester
Camp, J. D.	Rochester	Koelsche, G. A.	Rochester	Stalker, L. K.	Rochester
Canfield, W. W.	Houston	Kroeze, R. G.	Rochester	Steenrod, E. J.	Rochester
Carlson, L. A.	Rochester	Kvale, W. F.	Rochester	Steven, George	Byrns
Carow, T. E.	Rochester	Lanning, J. C.	Mabel	Stevens, G. A. W.	Rochester
Clark, L. W.	Spring Valley	Leddy, E. T.	Rochester	Stewart, E.	Rochester
Coate, J. D.	Rochester	Lemon, W. S.	Rochester	Stuart, H. A.	Rochester
Coffey, R. J.	Rochester	Lendrum, F. C.	Madison, Wis.	Stuhler, L. G.	Rochester
Collins, D. C.	Los Angeles, Calif.	Lenton, H. P.	Rochester	Sullivan, R. R.	Rochester
Comfort, M. W.	Rochester	Leser, R. U.	Rochester	Sutherland, C. G.	Rochester
Conner, H. M.	Rochester	Lillie, H. I.	Rochester	Sutton, L. F.	Mazepa
Cook, E. N.	Rochester	Lochead, D. C.	Rochester	Teall, R. C.	Rochester
Costello, R. T.	Rochester	Logan, A. H.	Rochester	Teem, M. Van B.	Rochester
Counseller, V. S.	Rochester	Love, J. G.	Rochester	Thiessen, N. W.	Rochester
Craig, R. W.	Rochester	Luden, Georgine	Victoria, B. C. Can.	Thompson, G. J.	Rochester
Crenshaw, J. L.	Rochester	Lundy, J. S.	Rochester	Tierney, C. M.	Harmony
Crew, J. E.	Rochester	Macey, H. B.	Rochester	Tovell, R. M.	Rochester
Curry, F. S.	Detroit, Mich.	Magath, T. B.	Rochester	Tuohy, E. B.	Rochester
Davenport, L. H.	Rochester	Magie, H. R.	Los Angeles, Calif.	Turnbull, A.	Rochester
Davis, A. C.	Rochester	Magiera, Estelle A.	Rochester	Vinson, P. P.	Rochester
Davis, I. G.	Rushford	Maisel, J. I.	New York, N. Y.	Wagener, H. P.	Rochester
Davis, P. L.	Rochester	Malerich, J. A.	Caledonia	Waldron, G. W.	Fort Peck, Montana
Deacon, A. E.	Rochester	Mann, F. C.	Rochester	Waltons, Waltman	Rochester
Deissler, K. J.	Oakland, Calif.	Marble, W. P.	Rochester	Ward, C. E.	Rochester
Desjardins, A. U.	Rochester	Masson, D. M.	Rochester	Watkins, C. H.	Rochester
Dixon, C. F.	Rochester	Masson, J. C.	Rochester	Waugh, J. M.	Rochester
Dolder, F. C.	Eyota	Mayo, C. H.	Rochester	Weber, H. M.	Rochester
Dorsey, J. M.	Rochester	Mayo, C. W.	Rochester	Weir, J. F.	Rochester
Drake, F. A.	Lanesboro	Mayo, T. G.	Rochester	Welch, C. S.	Rochester
Drips, Della G.	Rochester	Mayo, W. J.	Rochester	Wellbrock, W. L. A.	Rochester
Dry, T. J.	Rochester	Maytum, C. K.	Rochester	Welsh, A. L.	Rochester
Eaton, L. McK.	Rochester	McCarthy, W. C.	Rochester	Wesson, H. R.	Rochester
Edward, George	Canton	McCormack, C. J.	Rochester	Wherry, F. P., Jr.	Rochester
Emmett, J. B.	Rochester	McDonald, I. R.	Rochester	Whittaker, L. D.	Rochester
Eusterman, G. B.	Rochester	McGowan, J. M.	Rochester	Willbur, D. L.	Rochester
Evarts, A. B.	Rochester	McKaig, C. B.	Pine Island	Wildner, R. M.	Rochester
Faber, J. E.	Rochester	McKechnie, R. E.	Rochester	Williams, H. L., Jr.	Rochester
Fatherree, T. J., Jr.	Rochester	McTamoney, R. A.	Rochester	Williams, R. V.	Rushford
Fawcett, C. E.	Stewartville	Meyerding, H. W.	Rochester	Willis, F. A.	Rochester
Figi, F. A.	Rochester	Mills, J. H.	Rochester	Wilson, L. B.	Rochester
Fisher, Laura M.	Rochester	Moersch, F. P.	Rochester	Wolman, H. W.	Rochester
Foley, M. P.	Rochester	Moersch, H. J.	Rochester	Wood, H. G.	Rochester
Foster, F. P.	Rochester	Montgomery, Hamilton	Rochester	Woodruff, C. W.	Chatfield
		Mussey, R. D.	Rochester	Youngerman, W. M.	Rochester
		Nass, H. A.	Mabel	Zellhoefer, H. W. K.	Rochester
				Zide, H. A.	Rochester



# ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

## PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail and Wilkin Counties  
Regular meetings, Second Wednesday Every Even Month  
Annual meeting, October  
Number of Members: 48

### President

Janquist, E. J. . . . . Alexandria

### Secretary

Baker, N. H. . . . . Fergus Falls

Drought, W. W. . . . . Fergus Falls  
Esser, John. . . . . Perham  
Estrem, C. O. . . . . Fergus Falls  
Hand, W. R. . . . . Elbow Lake  
Hanson, E. C. . . . . New York Mills  
Haskell, A. D. . . . . Alexandria  
Heiberg, E. A. . . . . Fergus Falls  
Hodgson, C. H. . . . . Fergus Falls  
Jacobs, G. C. . . . . Fergus Falls  
Johnson, O. V. . . . . Fergus Falls  
Kemp, M. W. . . . . Fergus Falls  
Kierland, P. E. . . . . Alexandria  
Lee, W. A. . . . . Fergus Falls  
Leibold, H. H. . . . . Parkers Prairie  
Lewis, A. J. . . . . Henning  
Love, F. A. . . . . Carlos  
Lund, C. I. T. . . . . Underwood  
Meckstroth, C. W. . . . . Brandon  
Miller, W. A. . . . . New York Mills

Naegli, Frank . . . . . Fergus Falls  
Nelson, W. I. . . . . Minneapolis  
Otto, H. C. . . . . Frazee  
Parson, L. R. . . . . Elbow Lake  
Parson, E. Lillian B. . . . . Elbow Lake  
Patterson, W. L. . . . . Fergus Falls  
Paulson, T. S. . . . . Fergus Falls  
Powers, F. W. . . . . Barrett  
Recve, E. T. . . . . Elbow Lake  
Rimer, E. W. . . . . Breckenridge  
Satersmoen, Theodore . . . . . Pelican Rapids  
Sather, E. R. . . . . Alexandria  
Serkland, J. C. . . . . Rothsay  
Stafford, C. E. . . . . Dent  
Steube, R. W. . . . . Alexandria  
Tanquist, E. J. . . . . Alexandria  
Vail, J. B. . . . . Henning  
Windsor, R. L. . . . . Rothsay  
Wray, W. E. . . . . Campbell

## RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, Last Monday in every month excepting June, July, August  
Annual meeting, last Monday in January  
Number of Members: 320

### President

Burns, R. M. . . . . St. Paul

### Secretary

Hultkrans, J. C. . . . . St. Paul

Davis, William . . . . . St. Paul  
Dedolph, Karl . . . . . St. Paul  
Derauf, B. L. . . . . St. Paul  
Dickson, T. H., Jr. . . . . St. Paul  
Dittman, G. C. . . . . St. Paul  
Donohue, P. F. . . . . St. Paul  
Dovre, C. M. . . . . St. Paul  
Drake, C. B. . . . . St. Paul  
Dunn, J. N. . . . . St. Paul  
Earl, G. A. . . . . St. Paul  
Earl, R. O. . . . . St. Paul  
Edlund, G. . . . . So.  
Ely, O. S. . . . . St. Paul  
Emerson, E. C. . . . . St. Paul  
Endress, E. K. . . . . St. Paul  
Engberg, E. J. . . . . St. Paul  
Ernest, G. C. . . . . St. Paul  
Eshelby, E. C. . . . . St. Paul  
Fahey, E. W. . . . . St. Paul  
Ferguson, J. C. . . . . St. Paul  
Fesler, H. H. . . . . St. Paul  
Flanagan, H. F. . . . . St. Paul  
Fogarty, C. W. . . . . St. Paul  
Fogelberg, E. J. . . . . St. Paul  
Foley, F. E. B. . . . . St. Paul  
Freeman, C. D. . . . . St. Paul  
Gager, E. C. . . . . St. Paul  
Garbrecht, Arthur . . . . . St. Paul  
Gardiner, D. G. . . . . St. Paul  
Gardner, W. P. . . . . Hastings  
Geer, E. K. . . . . St. Paul  
Gehlen, J. N. . . . . St. Paul  
Geist, G. A. . . . . St. Paul  
Ghent, C. H. . . . . St. Paul  
Ghent, M. M. . . . . St. Paul  
Gillfillan, J. S. . . . . St. Paul  
Ginsberg, S. T. . . . . St. Paul  
Ginsberg, William . . . . . St. Paul  
Goltz, E. V. . . . . St. Paul  
Grant, H. W. . . . . St. Paul  
Gratzek, Thomas . . . . . St. Paul  
Gruenhagen, A. P. . . . . St. Paul  
Hagaman, G. K. . . . . St. Paul  
Hall, A. R. . . . . St. Paul  
Hall, H. H. . . . . St. Paul  
Hammes, E. M. . . . . St. Paul  
Hammond, J. F. . . . . St. Paul  
Harmon, G. E. . . . . St. Paul  
Hartfiel, W. F. . . . . St. Paul  
Hartley, E. C. . . . . St. Paul  
Hauser, V. . . . . St. Paul  
Hawkins, V. J. . . . . St. Paul  
Heath, A. C. . . . . Stillwater  
Heck, W. W. . . . . St. Paul  
Hedenstrom, F. G. . . . . St. Paul  
Hengstler, W. H. . . . . St. Paul  
Hensel, C. N. . . . . St. Paul  
Herrmann, E. T. . . . . St. Paul  
Heron, R. C. . . . . St. Paul  
Hesselgrave, S. S. . . . . St. Paul  
Hilger, A. W. . . . . St. Paul  
Hilger, D. D. . . . . St. Paul  
Hilger, L. A. . . . . St. Paul  
Hiniker, L. P. . . . . St. Paul  
Hochfilzer, J. J. . . . . St. Paul  
Hoff, Alfred . . . . . St. Paul  
Hoffman, M. H. . . . . St. Paul  
Holcomb, I. T. . . . . St. Paul  
Holcomb, O. W. . . . . St. Paul  
Holmen, R. W. . . . . St. Paul  
Holt, J. E. . . . . St. Paul  
Howard, M. A. . . . . St. Paul

Howard, W. S. . . . . St. Paul  
Hullsieck, R. B. . . . . St. Paul  
Hultkrans, J. C. . . . . St. Paul  
Ide, A. W. . . . . St. Paul  
Ikeda, Kano . . . . . St. Paul  
Johanson, W. G. . . . . St. Paul  
Johnson, A. M. . . . . St. Paul  
Johnson, I. A. . . . . St. Paul  
Johnson, R. G. . . . . St. Paul  
Johnson, T. H. . . . . San Francisco, Calif.  
Jones, D. C. . . . . St. Paul  
Jones, E. M. . . . . St. Paul  
Kadesky, David . . . . . San Francisco, Calif.  
Kamman, G. R. . . . . St. Paul  
Kannary, E. L. . . . . St. Paul  
Kaplan, D. H. . . . . St. Paul  
Kasper, E. M. . . . . St. Paul  
Kelly, J. V. . . . . St. Paul  
Kelly, P. H. . . . . St. Paul  
Kenebeck, E. V. . . . . St. Paul  
Kennedy, W. A. . . . . St. Paul  
Kesting, Herman . . . . . St. Paul  
King, G. L. . . . . St. Paul  
King, Z. P. . . . . St. Paul  
Klein, H. N. . . . . St. Paul  
Knauff, M. K. . . . . St. Paul  
Kugler, A. A. . . . . St. Paul  
Kvitrud, Gilbert . . . . . St. Paul  
Langenderfer, F. V. . . . . St. Paul  
Larsen, C. L. . . . . St. Paul  
Lax, M. H. . . . . St. Paul  
Leahy, Bartholomew . . . . . St. Paul  
Leavenworth, R. O. . . . . St. Paul  
Leitch, Archibald . . . . . St. Paul  
Leonard, G. J. . . . . St. Paul  
Lepak, J. A. . . . . St. Paul  
Lerche, William . . . . . Cable, Wis.  
Leven, N. L. . . . . St. Paul  
Levin, Bert . . . . . St. Paul  
Lewis, W. W. . . . . St. Paul  
Lick, C. L. . . . . St. Paul  
Lippman, H. S. . . . . St. Paul  
Little, W. J. . . . . St. Paul  
Livingstone, J. W. . . . . Hudson  
Lowe, E. R. . . . . So. St. Paul  
Lowe, T. A. . . . . So. St. Paul  
Lundholm, A. M. . . . . St. Paul  
Lynch, F. W. . . . . St. Paul  
Madden, J. F. . . . . St. Paul  
Markoe, J. C. . . . . St. Paul  
Martineau, J. L. . . . . St. Paul  
Mattson, C. H. . . . . St. Paul  
McCarthy, J. J. . . . . St. Paul  
McCarthy, W. R. . . . . St. Paul  
McClanahan, J. H. . . . . White  
McClanahan, T. S. . . . . White  
McCloud, C. N. . . . . St. Paul  
McKeon, Owen . . . . . St. Paul  
McLaren, J. M. . . . . St. Paul  
McNevin, C. F. . . . . St. Paul  
Meade, I. R. . . . . St. Paul  
Mears, B. J. . . . . St. Paul  
Meyerding, E. A. . . . . St. Paul  
Miller, E. W. . . . . St. Paul  
Moga, J. A. . . . . St. Paul  
Mogilner, S. N. . . . . St. Paul  
Molander, H. A. . . . . St. Paul  
Moquin, M. A. . . . . St. Paul  
Moran, T. R. . . . . St. Paul  
Moriarty, Berenice . . . . . St. Paul  
Morrissey, F. B. . . . . St. Paul  
Mortenson, N. G. . . . . St. Paul

# ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

Moss, M. N.	St. Paul	Rogers, J. T.	St. Paul	Strate, G. E.	St. Paul
Moynihhan, T. J.	St. Paul	Rogers, S. F.	St. Paul	Swanson, E. O.	St. Paul
Muller, R. T.	St. Paul	Rosenholtz, Burton	St. Paul	Swanson, J. A.	St. Paul
Myers, Thomas	St. Paul	Rosenthal, Robert	St. Paul	Swendson, J. J.	St. Paul
Naegeli, A. E.	St. Paul	Rothrock, J. L.	St. Paul	Teisberg, C. B.	St. Paul
Neher, F. H.	St. Paul	Rothschild, H. J.	St. Paul	Thompson, F. A.	St. Paul
Nelson, L. A.	St. Paul	Roy, Philemon	St. Paul	Thoreson, M. O.	St. Paul
Nichols, A. E.	St. Paul	Ruhberg, G. N.	St. Paul	Tift, C. R.	St. Paul
Nippert, H. T.	St. Paul	Rutherford, W. C.	St. Paul	Tregilgas, H. R.	So. St. Paul
Noble, J. F.	St. Paul	Ryan, J. J.	St. Paul	Van Slyke, C. A.	St. Paul
Nordin, C. G.	St. Paul	Ryan, J. M.	St. Paul	Veirs, Dean	St. Paul
Nye, Katherine A.	St. Paul	Ryan, M. E.	St. Paul	Veirs, Ruby S.	St. Paul
Nye, Lillian L.	Cortland, N. Y.	Satterlund, V. L.	St. Paul	Venables, A. E.	St. Paul
O'Connor, L. J.	St. Paul	Savage, F. J.	St. Paul	Von der Weyer, William	St. Paul
Oerting, Harry	St. Paul	Schoch, R. B.	St. Paul	Waas, C. W.	St. Paul
Ogden, Warner	St. Paul	Schons, Edward	St. Paul	Walker, A. E.	St. Paul
Ohage, Justus	St. Paul	Schuldt, F. C.	St. Paul	Walker, C. W.	St. Paul
Ohage, Justus, Jr.	St. Paul	Schulze, A. G.	St. Paul	Warnock, R. W.	St. Paul
Olson, C. A.	St. Paul	Schwyzzer, Arnold	St. Paul	Warren, E. L.	St. Paul
O'Reilly, B. E.	St. Paul	Scott, E. E.	St. Paul	Watz, C. E.	St. Paul
Ostergren, E. W.	St. Paul	Senkler, G. E.	St. Paul	Welch, M. C.	St. Paul
Oulette, A. J.	St. Paul	Setzer, H. J.	St. Paul	Werner, O. S.	Cambridge
Page, C. V.	St. Paul	Shellman, J.	St. Paul	Wheeler, M. W.	St. Paul
Pearson, F. R.	St. Paul	Shillington, M. A.	St. Paul	Whitacre, J. C.	St. Paul
Pedersen, A. H.	St. Paul	Short, Jacob	St. Paul	Whitmore, Frank	St. Paul
Perry, C. G.	St. Paul	Singer, B. J.	St. Paul	Williams, C. K.	St. Paul
Peterson, D. B.	St. Paul	Skinner, H. O.	St. Paul	Williamson, G. A.	St. Paul
Peterson, J. L. E.	St. Paul	Smisek, E. A.	St. Paul	Wilson, J. A.	St. Paul
Peterson, V. N.	St. Paul	Snyder, G. W.	St. Paul	Wilson, J. V.	St. Paul
Plondke, F. J.	St. Paul	Sohlberg, O. I.	St. Paul	Winnick, J. B.	St. Paul
Prendergast, H. J.	St. Paul	Souster, B. B.	St. Paul	Wold, K. C.	St. Paul
Prins, L. R., Jr.	St. Paul	Sprafka, J. M.	St. Paul	Wolfe, H. H.	St. Paul
Ramsey, W. R.	St. Paul	Sterner, E. G.	St. Paul	Wolf, H. J.	St. Paul
Richards, E. T. F.	St. Paul	Stevens, F. A.	St. Paul	Youngren, E. R.	St. Paul
Richardson, H. E.	St. Paul	Stewart, Alexander	Lake Elmo	Zachman, L. L.	St. Paul
Ritchie, H. P.	St. Paul	Stinnette, S. E.	St. Paul	Zander, C. H.	St. Paul
Rogers, F. D.	St. Paul	Stoeckmann, A. E.	St. Paul	Zimmermann, H. B.	St. Paul

## RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Mahanomen, Marshall, Norman, Pennington, Polk, Red Lake and Roseau Counties  
Regular meetings, Second Tuesday, April, October and December  
Annual meeting, Second Tuesday, December

Number of Members: 51

President	
Swedenburg, A. W.	Thief River Falls
Secretary	
Froats, C. W.	Thief River Falls
Adkins, C. M.	Thief River Falls
Anderson, W. S.	Minneapolis
Bernard, B. C.	Thief River Falls
Bertelson, O. L.	Crookston
Biedermann, Jacob	Thief River Falls
Blegen, H. M.	Warren
Boardman, D. V.	Twin Valley
Bohl, G. W. E.	Ada
Bratrud, O. E.	Thief River Falls
Brown, L. L.	Crookston
Button, A. J.	Pine River
Carlson, C. E.	Stephen
Culver, L. G.	Thief River Falls

Delmore, J. L.	Roseau
Erickson, Eskil	Halstad
Froats, C. W.	Thief River Falls
Griffin, P. J.	Fertile
Hansen, Marius	Ada
Haugseth, Enoch	Twin Valley
Henney, W. H.	McIntosh
Hollands, W. H.	Fisher
Holmstrom, C. H.	Warren
Holte, Halvor	Crookston
Kirk, G. P.	East Grand Forks
Knutson, G. A.	Greenbush
Leitch, N. M.	Warroad
Locken, O. E.	Crookston
Lynde, O. G.	Thief River Falls
Melby, O. F.	Thief River Falls
Mercil, W. F.	Crookston
Morley, G. A.	Crookston
Nelson, H. E.	Crookston

Norman, J. F.	Crookston
Ohnstad, J. L.	McIntosh
Oppegard, C. L.	Crookston
Oppegard, M. O.	Crookston
Overend, K. V.	Hallack
Paradis, W. G.	Crookston
Parsons, J. G.	Crookston
Reff, A. R.	Crookston
Roy, J. A.	Red Lake Falls
Shalen, A. W.	Hallack
Shedlov, Abraham	Fosston
Smith, A. M.	Thief River Falls
Stuurmanns, S. H.	Erskine
Swendenburg, A. W.	Thief River Falls
Swendenburg, P. A.	Chula, Ark.
Torgerson, W. B.	Oklee
Wend, N. M.	Red Lake Falls
Weed, V. A.	Red Lake Falls
Wiltout, I. G.	Oslo

## REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Annual meeting, May  
Number of Members: 25

President	
Kusske, A. L.	New Ulm
Secretary	
Saffert, C. A.	New Ulm
Brey, F. W.	Wabasso
Dubbe, F. H.	New Ulm
Dysterheft, A. F.	Gaylord

Fritsche, Albert	New Ulm
Fritsche, C. J.	New Ulm
Gibbons, F. C.	Comfrey
Goblirsch, A. P.	Sleepy Eye
Hammermeister, T. F.	New Ulm
Hovde, Rolf	Winthrop
Jamieson, Earl	Walnut Grove
Johnson, W. E.	Morgan
Just, H. J.	Lafayette
Kolset, C. D.	Sanborn
Kusske, A. L.	New Ulm

Olson, K. L.	Gibson
Peterson, R. A.	Vesta
Reineke, G. F.	New Ulm
Rothenburg, J. C.	Springfield
Saffert, C. A.	New Ulm
Seifert, O. J.	New Ulm
Shrader, J. S.	Hollandale
Vogel, H. A. L.	New Ulm
Vogel, J. H.	New Ulm
Weiser, G. B.	New Ulm
Wohlrahe, E. J.	Springfield

## RENNVILLE COUNTY MEDICAL SOCIETY

Regular meeting, First Tuesday of each month  
Annual meeting, First Tuesday of November  
Number of Members: 17

President	
Madland, R. S.	Fairfax
Secretary	
Dordal, J.	Sacred Heart
Adams, R. C.	Bird Island

Billings, R. E.	Franklin
Brand, W. A.	Redwood Falls
Cole, H. B.	Redwood Falls
Cole, J. G.	Redwood Falls
Cosgriff, J. A.	Bird Island
Dordal, J.	Sacred Heart
Fawcett, A. M.	Renville
Flinn, T. E.	Redwood Falls

Gaines, E. C.	Buffalo Lake
Johnson, O. H.	Redwood Falls
Loenholtz, E. H.	Hector
Madland, R. S.	Fairfax
Mesker, G. H.	Olivia
Passer, A. A.	Olivia
Penhall, F. W.	Morton
Soisem, F. N.	Sacred Heart

# ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

## RICE COUNTY MEDICAL SOCIETY

Regular meeting, At call  
Annual meeting, December  
Number of Members: 39

President  
Murdoch, J. M. . . . .Faribault

Secretary  
Plonske, C. J. . . . .Faribault

Babcock, F. M. . . . .Northfield  
Beede, Ethel R. . . . .Faribault  
Davis, F. U. . . . .Faribault  
Dugan, L. F. . . . .Faribault  
Dungay, N. S. . . . .Northfield  
Engstrom, F. A. . . . .Wanamingo  
Francis, D. W. . . . .Faribault  
Hanson, A. M. . . . .Faribault  
Huxley, F. R. . . . .Faribault

Haessly, S. B. . . . .Faribault  
Hamilton, Angie G. S. . . . .Northfield  
Haynes, A. L. . . . .Faribault  
Kanne, C. W. . . . .Faribault  
Kucera, S. T. . . . .Lonsdale  
Kuske, A. W. . . . .Faribault  
Lufkin, C. D. . . . .Northfield  
Lende, Norman . . . . .Faribault  
Lexa, F. J. L. . . . .Lonsdale  
Mayland, M. E. . . . .Faribault  
Meyer, F. C. . . . .Kenyon  
Meyer, P. F. . . . .Faribault  
Moses, Joseph, Jr. . . . .Northfield  
Murdoch, J. M. . . . .Faribault  
Nuetzman, A. W. . . . .Faribault

Plonske, C. J. . . . .Faribault  
Robilliard, C. M. . . . .Northfield  
Rumpf, C. W. . . . .Faribault  
Rumpf, W. H. . . . .Faribault  
Rudie, C. N. . . . .Kenyon  
Rohrer, C. A. . . . .Waterville  
Seeley, I. F. . . . .Northfield  
Smith, P. A. . . . .Faribault  
Stewart, Gwendolyn . . . . .Faribault  
Traeger, C. A. . . . .Faribault  
Thorson, O. P. . . . .Northfield  
Warren, F. S. . . . .Washington, D. C.  
Wilkowski, R. J. . . . .Nerstrand  
Wilson, W. E. . . . .Northfield  
Wilson, Warren . . . . .Northfield

## ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Itasca, Lake and St. Louis Counties  
Regular meeting, Second Thursday every month  
Annual meeting, October  
Number of Members: 160

President  
Bagley, W. R. . . . .Duluth

Secretary  
Gillespie, M. G. . . . .Duluth

Adams, B. S. . . . .Hibbing  
Akins, W. M. . . . .Eveleth  
Alexander, C. E. . . . .Duluth  
Armstrong, E. L. . . . .Duluth  
Athens, A. G. . . . .Duluth  
Ayres, G. T. . . . .Ely  
Bagley, W. R. . . . .Duluth  
Bardon, Richard . . . . .Duluth  
Barney, L. A. . . . .Duluth  
Barrett, E. E. . . . .Duluth  
Berdez, G. L. . . . .Duluth  
Bergquist, K. E. . . . .Duluth  
Bianco, A. J. . . . .Duluth  
Binet, H. E. . . . .Grand Rapids  
Blacklock, S. S. . . . .Hibbing  
Blakely, C. C. . . . .Barnum  
Doman, P. G. . . . .Duluth  
Bowen, R. L. . . . .Hibbing  
Boyer, S. H., Jr. . . . .Duluth  
Boyer, S. H., Sr. . . . .Duluth  
Braverman, N. J. . . . .Duluth  
Bray, C. W. . . . .Biwabik  
Bray, P. N. . . . .Duluth  
Bullen, F. W. . . . .Hibbing  
Cantwell, W. F. . . . .International Falls  
Carstens, C. F. . . . .Hibbing  
Chapman, T. L. . . . .Duluth  
Clement, T. G. . . . .Duluth  
Collins, A. N. . . . .Duluth  
Collins, H. C. . . . .Duluth  
Coventry, W. A. . . . .Duluth  
Davis, B. F. . . . .Duluth  
Doolittle, L. E. . . . .Duluth  
Doyle, G. C. . . . .Duluth  
Drenning, F. C. . . . .Duluth  
Eckman, P. F. . . . .Duluth  
Eckman, R. J. . . . .Duluth  
Ekblad, J. W. . . . .Duluth  
Elias, F. J. . . . .Duluth  
Emanuel, K. W. . . . .Duluth  
Eppard, R. M. . . . .Cloquet  
Ewens, H. B. . . . .Virginia  
Fawcett, K. R. . . . .Duluth  
Fellows, M. F. . . . .Duluth  
Feuling, John . . . . .Bovey  
Fiala, M. J. . . . .Duluth  
Fischer, M. McC. . . . .Duluth  
Garrow, D. M. . . . .Ely

Gillespie, M. G. . . . .Duluth  
Gillespie, N. H. . . . .Duluth  
Gowan, L. R. . . . .Duluth  
Graham, Robert . . . . .Duluth  
Graves, W. N. . . . .Duluth  
Haney, C. L. . . . .Duluth  
Harris, C. N. . . . .Nashwauck  
Hatch, W. E. . . . .Duluth  
Hathaway, S. J. . . . .Proctor  
Hayes, M. F. . . . .Nashwauck  
Hedberg, G. A. . . . .Nopeming  
Heiam, W. C. . . . .Cook  
Heimark, O. E. . . . .Duluth  
Hilding, A. C. . . . .Duluth  
Hill, F. E. . . . .Duluth  
Hirschboeck, F. J. . . . .Duluth  
Hirschfeld, M. S. . . . .Duluth  
Jacobson, Clarence . . . . .Chisholm  
Jensen, T. J. . . . .Duluth  
Jolin, F. M. . . . .Grand Rapids  
Karleen, P. E. . . . .Deer River  
Keyes, C. R. . . . .Duluth  
Klein, Harry . . . . .Duluth  
Knapp, F. N. . . . .Duluth  
Kohlbr, C. O. . . . .Duluth  
Kotchevar, F. R. . . . .Eveleth  
Kraft, Peter . . . . .Duluth  
Krantz, C. I. . . . .Duluth  
Kuth, J. R. . . . .Duluth  
Laird, A. T. . . . .Nopeming  
Lenont, C. B. . . . .Virginia  
Lepak, F. J. . . . .Duluth  
Litman, S. N. . . . .Duluth  
Loofhourrow, E. H. . . . .Keewatin  
Lum, C. E. . . . .Niswau  
MacRae, C. C. . . . .Duluth  
Magney, F. H. . . . .Duluth  
Malmstrom, J. A. . . . .Virginia  
Martin, E. T. . . . .Duluth  
Martin, W. C. . . . .Duluth  
Mayne, R. M. . . . .Duluth  
McCarty, P. D. . . . .Ely  
McComb, C. F. . . . .Duluth  
McCoy, Mary K. . . . .Duluth  
McDaniel, S. P. . . . .Mountain Iron  
McDonald, A. L. . . . .Duluth  
McNutt, J. R. . . . .Duluth  
Mead, C. H. . . . .Duluth  
Mead, N. C. . . . .Coleraine  
Merriman, L. L. . . . .Duluth  
Miners, G. A. . . . .Deer River  
Moe, R. J. . . . .Duluth  
Monroe, P. B. . . . .Two Harbors  
Mooney, I. F. . . . .Marble  
More, C. W. . . . .Eveleth  
Morsman, L. W. . . . .Hibbing

Morss, C. R. . . . .Zumbrota  
Mueller, S. C. . . . .Duluth  
Nelson, E. H. . . . .Chisholm  
Nelson, R. L. . . . .Duluth  
Nicholson, M. A. . . . .Duluth  
Nutting, R. E. . . . .Duluth  
Olson, A. E. . . . .Duluth  
Parker, O. W. . . . .Ely  
Pennie, D. F. . . . .Duluth  
Peterson, E. N. . . . .Eveleth  
Peterson, J. H. . . . .Duluth  
Power, J. E. . . . .Duluth  
Raadquist, C. S. . . . .Hibbing  
Raider, F. W. S. . . . .Cloquet  
Raider, R. F. . . . .Cloquet  
Robinson, J. M. . . . .Duluth  
Rood, D. C. . . . .Hibbing  
Rowe, O. W. . . . .Duluth  
Rudie, P. S. . . . .Duluth  
Ryan, W. J. . . . .Duluth  
Salter, R. A. . . . .Virginia  
Sarff, O. E. . . . .Buhl  
Scherer, C. A. . . . .Duluth  
Schroder, C. H. . . . .Duluth  
Seashore, D. E. . . . .Duluth  
Seashore, R. T. . . . .Duluth  
Shapiro, E. Z. . . . .Duluth  
Shastid, T. H. . . . .Duluth  
Shaw, A. W. . . . .Buhl  
Sinamark, Andrew . . . . .Hibbing  
Slyfield, F. F. . . . .Duluth  
Smith, C. M. . . . .Duluth  
Smith, W. R. . . . .Grand Marais  
Spicer, F. W. . . . .Duluth  
Spurbeck, R. G. . . . .Cloquet  
Strathern, M. L. . . . .Gilbert  
Strobel, W. G. . . . .Duluth  
Stewart, A. B. . . . .Cloquet  
Sukeforth, L. A. . . . .Duluth  
Sutherland, H. N. . . . .Ely  
Swanson, P. E. . . . .Virginia  
Swenson, A. O. . . . .Duluth  
Tibbets, M. H. . . . .Duluth  
Tilderquist, D. L. . . . .Duluth  
Tuohy, E. L. . . . .Duluth  
Urberg, S. E. . . . .Duluth  
Vercellini, C. E. . . . .Duluth  
Walker, A. E. . . . .Duluth  
Webber, E. E. . . . .Duluth  
West, E. J. . . . .Duluth  
Wheeler, D. W. . . . .Duluth  
Wilkinson, Stella L. . . . .Duluth  
Winter, J. A. . . . .Duluth  
Young, T. O. . . . .Duluth  
Young, V. A. . . . .Duluth  
Zlatovski, Michael . . . . .Duluth

## SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, Second Tuesday of the month  
Annual meeting, Second Tuesday, June  
Number of Members: 28

President  
Martin, T. P. . . . .Arlington

Secretary  
Hospodarsky, L. J. . . . .New Prague

Buck, F. H. . . . .Shakopee  
Cervenk, C. F. . . . .New Prague  
Eklund, E. J. . . . .Norwood  
Emmerson, W. S. . . . .Mayer

Fischer, H. P. . . . .Shakopee  
Fischer, P. M. . . . .Shakopee  
Havel, H. W. . . . .Shakopee  
Hebeisen, M. B. . . . .Chaska  
Henriksen, H. G. . . . .Elko  
Hospodarsky, L. J. . . . .New Prague  
Juergens, H. M. . . . .Belle Plaine  
Lighthourn, E. T. . . . .Jordan  
Maertz, W. F. . . . .New Prague  
Martin, T. P. . . . .Arlington  
Nagel, H. D. . . . .Waconia  
Novak, E. E. . . . .New Prague

Olson, C. J. . . . .Belle Plaine  
Ormond, D. T. . . . .Waconia  
Phillips, W. H. . . . .Jordan  
Reiter, H. W. . . . .Shakopee  
Schmelpfening, G. T. . . . .Chaska  
Schneider, H. A. . . . .Jordan  
Simons, B. H. . . . .Chaska  
Stein, K. E. . . . .Lakeville  
Westerman, A. E. . . . .Montgomery  
Westerman, F. C. . . . .Montgomery  
Woodworth, L. F. . . . .Le Center  
Wunder, H. E. . . . .Shakopee

# ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

## SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone, and Rock Counties  
Regular meetings, Spring and Fall  
Annual meeting, November  
Number of Members: 53

President  
Halloran, W. H. .... Jackson  
Secretary  
DeBoer, Hermanus. .... Edgerton  
Arnold, E. W. .... Adrian  
Basinger, H. P. .... Windom  
Basinger, H. R. .... Mountain Lake  
Benjamin, W. G. .... Pipestone  
Bofenkamp, F. W. .... Laverne  
Brown, A. H. .... Pipestone  
Chadbourne, A. G. .... Heron Lake  
Cress, P. J. .... Ellsworth  
DeBoer, Hermanus. .... Edgerton  
Dolan, C. P. .... Worthington  
Doms, H. C. .... Slayton  
Dudley, J. H. .... Windom  
Engl, Sigfried. .... Jackson

Halloran, W. H. .... Jackson  
Halpern, D. J. .... Brewster  
Harrison, P. W. .... Worthington  
Hitchings, W. S. .... Lakefield  
Johnson, R. E. .... Worthington  
Kelling, L. F. .... Lakefield  
Kilbride, E. A. .... Worthington  
Larson, J. T. .... Lake Wilson  
Lindahl, M. J. .... Jasper  
Lowe, Thos. P. .... Pipestone  
Maitland, D. P. .... Jackson  
Manson, F. M. .... Worthington  
McCrea, J. M. .... Fulda  
McKeown, E. G. .... Pipestone  
McLane, Evelyn G. .... Jackson  
McLane, W. O. .... Jackson  
Mork, B. O. .... Worthington  
Mork, B. O., Jr. .... Worthington  
Pankratz, P. J. .... Mountain Lake  
Perril, A. L. .... Windom

Piper, W. A. .... Mountain Lake  
Portmann, W. C. .... Jackson  
Priest, R. E. .... Worthington  
Rose, J. T. .... Lakefield  
Ross, W. P. .... Worthington  
Schutz, E. S. .... Mountain Lake  
Sherman, C. L. .... Laverne  
Slater, S. A. .... Worthington  
Sogge, L. L. .... Windom  
Sorenson, E. M. .... Round Lake  
Stanley, C. R. .... Worthington  
Stevenson, B. M. .... Fulda  
Stratte, H. C. .... Windom  
Thorson, E. O. .... Laverne  
Tofte, Josephine. .... Dawson  
Waller, J. D. .... Wilmont  
Williams, A. B. .... St. Paul  
Williams, L. A. .... Pipestone  
Williams, L. A. .... Slayton  
Wright, C. O. .... Laverne

## STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, Third Thursday of the month  
Annual meeting, Third Thursday of December  
Number of Members: 39

President  
Goehrs, H. W. .... St. Cloud  
Secretary  
Libert, J. N. .... St. Cloud  
Beuning, J. B. .... Albany  
Brigham, C. F. .... St. Cloud  
Buscher, J. C. .... St. Cloud  
DuBois, J. A. .... Sauk Center  
DuBois, J. F. .... Sauk Center  
Engstrom, G. F. .... Belgrade  
Freeman, W. L. .... St. Cloud  
Friesleben, Wm. .... Sauk Rapids  
Gelz, J. J. .... St. Cloud

Goehrs, H. W. .... St. Cloud  
Haberman, Emil. .... Osakis  
Hemstead, Werner. .... St. Cloud  
Johnson, Walfred. .... Sauk Center  
Jones, R. N. .... St. Cloud  
Kettlewell, R. B. .... Sauk Center  
Kohler, D. W. .... St. Joseph  
Koop, S. H. .... Richmond  
Kuhlmann, August. .... Melrose  
Lewis, C. B. .... St. Cloud  
Libert, J. N. .... St. Cloud  
McDowell, J. P. .... St. Cloud  
Mahowald, A. .... Albany  
Mass, Max. .... Cold Spring  
Meyer, A. A. .... Melrose

Moynihan, A. F. .... Sauk Center  
Myre, C. R. .... Paynesville  
Norris, G. H. .... Annandale  
Rathbun, A. M. .... Rice  
Rathbun, C. A. .... St. Cloud  
Richards, W. B. .... St. Cloud  
Ridgeway, Alexander. .... South Haven  
Rydburg, W. C. .... Broten  
Schatz, F. J. .... St. Cloud  
Sherwood, G. E. .... Kimball  
Stangl, Fred. .... St. Cloud  
Stangl, P. E. .... St. Cloud  
Sutton, C. S. .... St. Cloud  
Venner, W. T. .... St. Cloud  
Zachman, A. H. .... Melrose

## STEELE COUNTY MEDICAL SOCIETY

Regular meetings, Second Tuesday of odd months  
Annual meeting, Last meeting of the year  
Number of Members: 18

President  
Dewey, D. H. .... Owatonna  
Secretary  
Berghs, L. V. .... Owatonna  
Berghs, L. V. .... Owatonna  
Carlson, Verne. .... Blooming Prairie

Dewey, D. H. .... Owatonna  
Ertel, E. O. .... Ellendale  
Farabaugh, C. L. .... Owatonna  
Flores, O. T. .... Dodge Center  
Hartung, E. H. .... Claremont  
Kreuzer, T. C. .... Owatonna  
McEnaney, C. T. .... Owatonna  
McIntyre, J. A. .... Owatonna

Melby, Benedik. .... Blooming Prairie  
Morehead, D. E. .... Owatonna  
Nelson, E. J. .... Owatonna  
Roberts, O. W. .... Owatonna  
Schaefer, J. F. .... Owatonna  
Senn, E. W. .... Owatonna  
Smersh, J. F. .... Owatonna  
Stewart, A. B. .... Owatonna

## UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Koochiching, Lake of the Woods,  
Morrison, Todd and Wadena Counties  
Regular meetings, Spring, Summer, Fall, Winter  
Annual meeting, January  
Number of Members: 79

President  
Simons, E. J. .... Swanville  
Secretary  
Badeaux, G. I. .... Brainerd  
Agnew, A. T. .... International Falls  
Anderson, C. E. .... Brainerd  
Badeaux, G. I. .... Brainerd  
Beise, R. A. .... Brainerd  
Blomberg, W. R. .... Aitkin  
Borgerson, A. H. .... Sebeka  
Bosland, H. G. .... Verndale  
Bowers, J. T. .... Bemidji  
Brink, A. A. .... Baudette  
Burns, H. A. .... Ah-Gwah-Ching  
Christie, G. R. .... Long Prairie  
Christie, R. L. .... Long Prairie  
Cook, J. M. .... Staples  
Corrigan, J. E. .... Spooner  
Craig, C. C. .... International Falls  
Davis, L. T. .... Wadena  
Davis, T. C. .... Wadena  
Frost, H. T. .... Wadena  
Garlock, A. V. .... Bemidji  
Garlock, D. H. .... Bemidji  
Gerber, M. P. .... Brainerd

Ghostley, Mary C. .... Puposky  
Gifford, B. L. .... Hewitt  
Grawn, F. A. .... Northome  
Grogan, J. S. .... Wadena  
Groschupf, T. P. .... Bemidji  
Grose, F. N. .... Clarissa  
Hanover, R. D. .... Littlefork  
Hanson, E. C. .... Park Rapids  
Hawkinson, J. P. .... Crosby  
Hawkinson, L. F. .... Brainerd  
Healy, R. T. .... Pierz  
Hendrickson, R. R. .... Wadena  
Higgs, W. W. .... Park Rapids  
Holst, C. F. .... Little Falls  
Holst, J. B. .... Little Falls  
Holt, G. W. .... Ely  
House, Z. E. .... Cass Lake  
Houston, C. A. .... Park Rapids  
Hubbard, O. E. .... Brainerd  
Hubin, E. G. .... Deerwood  
Jacobson, D. J. .... Blackduck  
Johnson, E. W. .... Bemidji  
Kelly, B. W. .... Aitkin  
Kerlan, S. Z. .... Aitkin  
Lamb, H. L. .... Little Falls  
Laney, R. L. .... Fertile  
Larson, L. M. .... Oak Terrace  
Larson, L. J. .... Bagley  
Laughlin, J. T. .... Grey Eagle

Marcum, E. H. .... Bemidji  
Mark, Hilbert. .... Ah-Gwah-Ching  
McHugh, R. F. .... Aitkin  
Mosby, M. E. .... Browerville  
Moyer, R. E. .... Fort Snelling  
Nelson, Nesmith. .... Brainerd  
Osburn, B. F. .... International Falls  
Pierce, C. H. .... Wadena  
Quannstrom, V. E. .... Brainerd  
Raymond, J. H. .... Cass Lake  
Ringle, O. F. .... Walker  
Roberts, L. M. .... Little Falls  
Rosenfield, A. B. .... Pequot  
Sach-Rowitz, Alvin. .... Moose Lake  
Sellers, G. K. .... Motley  
Shannon, S. S. .... Crosby  
Simons, E. J. .... Swanville  
Smith, B. A. .... Crosby  
Smith, E. H. .... Bemidji  
Smith, E. H. .... Eagle Bend  
Stein, R. J. .... Pierz  
Stevens, John. .... Gonvick  
Thabes, J. A., Jr. .... Brainerd  
Thabes, J. A., Sr. .... Brainerd  
Van Valkenburg, B. F. .... Long Prairie  
Watson, A. M. .... Royalton  
Watson, J. D. .... Holdingford  
Will, W. W. .... Bertha  
Withrow, M. E. .... International Falls



# ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

## WABASHA COUNTY MEDICAL SOCIETY

Regular meetings, Call of Officers  
Annual meeting, First Thursday after first Monday in July  
Number of Members: 11

<b>President</b>		Bayley, E. C. .... Lake City	Ochsner, C. G. .... Wabasha
Radabaugh, R. C. .... Hastings		Cochrane, W. J. .... Lake City	Radabaugh, R. C. .... Hastings
<b>Secretary</b>		Collins, J. S. .... Wabasha	Sherman, H. T. .... Plainview
Wilson, W. F. .... Lake City		Fleischhauer, D. S. .... Wabasha	Slocumb, J. A. .... Plainview
		Flesche, B. A. .... Lake City	Wilson, W. F. .... Lake City
		Frost, R. H. .... Wabasha	

## WASECA COUNTY MEDICAL SOCIETY

Annual meeting, Third Friday in December  
Number of Members: 9

<b>President</b>		Bernstein, W. C. .... New Richland	McIntire, H. M. .... Waseca
Swenson, O. J. .... Waseca		Chadborn, C. R. .... Janesville	Oeljen, S. C. G. .... Waseca
<b>Secretary</b>		Gallagher, B. J. .... Waseca	Swenson, O. J. .... Waseca
Chadborn, C. R. .... Janesville		Hottinger, R. C. .... Janesville	Tavener, J. L. .... Waseca
		Lynn, J. F. .... Waseca	

## WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, Second Tuesday in January, February, March, April, May,  
September, October, November and December  
Annual meeting, Second Tuesday in December  
Number of Members: 16

<b>President</b>		Brekke, H. J. .... Stillwater	Mingo, F. E. .... Hugo
Brooks, G. F. .... Stillwater		Brooks, G. F. .... Stillwater	Poirer, J. A. .... Forest Lake
<b>Secretary</b>		Ewald, R. P. .... Newport	Ruggles, G. McC. .... Forest Lake
Boleyn, E. S. .... Stillwater		Haines, J. H. .... Stillwater	Strand, E. V. .... Bayport
Boleyn, E. S. .... Stillwater		Humphrey, W. R. .... Stillwater	Stuhr, J. W. .... Stillwater
		Josewski, R. J. .... Stillwater	Thompson, V. C. .... Marine-on-St. Croix
		Kalinoff, D. .... Stillwater	Van Meier, Henry. .... Stillwater
		Linner, Gunnar. .... Stillwater	

## WATONWAN COUNTY MEDICAL SOCIETY

Regular meeting, At call  
Annual meeting, December  
Number of Members: 8

<b>President</b>		Bergman, O. B. .... St. James	Hagen, O. E. .... Butterfield
Thompson, Albert. .... St. James		Bratrud, E. J. .... St. James	Haynes, B. H. .... Lewisville
<b>Secretary</b>		Bregel, F. L. .... St. James	McCarthy, W. J. .... Madelia
Grimes, H. B. .... Madelia		Grimes, H. B. .... Madelia	Thompson, Albert. .... St. James

## WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens and Traverse Counties  
Regular meetings, Second Wednesday of January, April and June  
Annual meeting, Second Wednesday, October  
Number of Members: 24

<b>President</b>		Caine, C. E. .... Morris	Leland, J. T. .... Herman
Giesen, A. F. .... Starbuck		Cumming, J. F. .... Morris	Lindberg, A. L. .... Wheaton
<b>Secretary</b>		Doleman, N. F. .... Tintah	Linde, Herman. .... Cyrus
Nelson, M. C. .... Lowry		Eberlin, E. A. .... Glenwood	McIver, B. A. .... Lowry
Arneson, A. I. .... Morris		Else, E. McC. .... Glenwood	McKenna, M. J. .... Graceville
Bates, B. V. .... Browns Valley		Else, J. R. .... Glenwood	Nelson, M. C. .... Lowry
Bergan, Otto. .... Clinton		Ewing, C. F. .... Wheaton	Oliver, C. L. .... Graceville
Bolsta, Chas. .... Ortonville		Fitzgerald, E. T. .... Morris	Oliver, I. L. .... Graceville
		Giesen, A. F. .... Starbuck	Ransom, M. L. .... Hancock
		Karn, B. R. .... Ortonville	Shelver, H. J. .... Ortonville

## WINONA COUNTY MEDICAL SOCIETY

Regular meetings, First Monday in January, April, July and October  
Annual meeting, First Monday in January  
Number of Members: 24

<b>President</b>		Keyes, J. D. .... Winona	Risser, E. D. .... Winona
Christensen, E. E. .... Winona		Kroning, C. G. .... St. Charles	Robbins, C. P. .... Winona
<b>Secretary</b>		Litchenstein, H. .... Winona	Satterlee, H. W. .... Lewiston
Steiner, I. W. .... Winona		Lindsay, W. V. .... Winona	Schaefer, S. .... Winona
Benoit, F. T. .... Winona		Mattison, P. A. .... Winona	Steiner, I. W. .... Winona
Christensen, E. E. .... Winona		McLaughlin, E. M. .... Winona	Tweedy, G. J. .... Winona
Clay, F. H. .... St. Charles		Meinert, A. E. .... Winona	Walker, G. H. .... Winona
Heise, W. F. C. .... Winona		Nauth, W. W. .... Winona	Wilson, R. H. .... Winona
		Neumann, C. A. .... Winona	Younger, L. I. .... Winona
		Page, R. L. .... St. Charles	Zintex, A. R. .... Winona

## WRIGHT COUNTY MEDICAL SOCIETY

Regular meeting, First Tuesday after first Monday, Quarterly  
Annual meeting, October  
Number of Members: 21

<b>President</b>		Catlin, T. J. .... Buffalo	Lee, J. L. .... Watertown
Hart, W. E. .... Monticello		Ellison, F. E. .... Monticello	Olson, J. W. .... Kokato
<b>Secretary</b>		Grundset, O. J. .... Montrose	Peterson, O. L. .... Kokato
Catlin, J. J. .... Buffalo		Hansen, Rorbye. .... Monticello	Phillips, A. E. .... Delano
Anderson, W. P. .... Buffalo		Harriman, L. .... Howard Lake	Roholt, C. L. .... Waverly
Bendix, L. H. .... Annandale		Hart, W. E. .... Monticello	Rousseau, Victor. .... Maple Lake
Catlin, J. J. .... Buffalo		Hoyer, L. J. .... Howard Lake	Ridgway, A. M. .... Annandale
		Johnson, V. P. .... Delano	Swezey, B. F. .... Buffalo
		Klaveness, E. .... St. Paul	Thompson, Arthur. .... Kokato

May, 1935

# ALPHABETIC ROSTER

Aanes, A. M. .... Red Wing  
Abbott, J. S. .... St. Paul  
Aborn, W. H. .... Hawley  
Adams, B. S. .... Hibbing  
Adams, R. C. .... Bird Island  
Adkins, C. M. .... Thief River Falls  
Adson, A. W. .... Rochester  
Affeldt, D. E. .... Kasson  
Agnew, A. T. .... International Falls  
Ahrens, A. E. .... St. Paul  
Ahrens, A. H. .... St. Paul  
Ahrens, R. S. .... Minneapolis  
Aitkens, H. B. .... Le Center  
Akester, Ward. .... Marshall  
Alkins, W. M. .... Eveleth  
Albers, E. C. .... Champaign, Ill.  
Alberts, M. W. .... St. Paul  
Alden, J. F. .... St. Paul  
Alexander, C. E. .... Duluth  
Alexander, F. H. .... St. Paul  
Alexander, H. A. .... Minneapolis  
Ailing, C. W. .... Minneapolis  
Allen, A. W. .... Austin  
Allen, C. C. .... Austin  
Allen, E. V. .... Rochester  
Allen, H. W. .... Minneapolis  
Allison, R. G. .... Minneapolis  
Altnow, H. O. .... Minneapolis  
Alvarez, W. C. .... Rochester  
Amberg, Samuel. .... Rochester  
Andersen, A. G. .... Minneapolis  
Andersen, S. C. .... Minneapolis  
Anderson, C. E. .... Brainerd  
Anderson, C. M. .... Rochester  
Anderson, C. R. .... Rochester  
Anderson, D. D. .... Minneapolis  
Anderson, E. D. .... Minneapolis  
Anderson, E. R. .... Minneapolis  
Anderson, F. J. .... Minneapolis  
Anderson, J. K. .... Minneapolis  
Anderson, K. W. .... Minneapolis  
Anderson, M. Y. .... Rochester  
Anderson, N. E. .... Harmony  
Anderson, P. A. .... Minneapolis  
Anderson, R. E. .... Willmar  
Anderson, S. H. .... Red Wing  
Anderson, U. S. .... Minneapolis  
Anderson, W. P. .... Buffalo  
Anderson, W. S. .... Minneapolis  
Andreassen, E. C. .... Minneapolis  
Andrews, R. N. .... Mankato  
Annis, H. B. .... Minneapolis  
Archibald, F. M. .... Mahanomen  
Arends, A. L. .... Askov  
Arey, S. L. .... Excelsior  
Arlander, C. E. .... Minneapolis  
Armstrong, E. L. .... Duluth  
Armstrong, J. M. .... St. Paul  
Arneson, A. I. .... Morris  
Arnold, D. C. .... Minneapolis  
Arnold, E. A. .... Adrian  
Arquist, A. S. .... St. Paul  
Arnsen, J. M. .... Benson  
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Aune, Martin. .... Minneapolis  
Aurand, W. H. .... Minneapolis  
Aurelius, J. R. .... St. Paul  
Ausman, C. F. .... St. Paul  
Avery, J. F. .... Minneapolis  
Ayres, G. T. .... Ely

Babeock, F. M. .... Northfield  
Backus, A. S. .... St. Paul  
Bacon, D. K. .... St. Paul  
Bacon, L. C. .... St. Paul  
Bacon, R. S. .... Montevideo  
Badeaux, G. L. .... Brainerd  
Bagley, W. R. .... Duluth  
Bailey, H. B. .... Fairmont  
Bailey, R. J. .... Rochester  
Bair, H. L. .... Rochester  
Baken, M. P. .... Minneapolis  
Baker, A. C. .... Fergus Falls  
Baker, A. T. .... Minneapolis  
Baker, C. P. .... Rochester  
Baker, E. L. .... Minneapolis  
Baker, H. R. .... Hayfield  
Baker, Loee. .... Minneapolis  
Baker, N. H. .... Fergus Falls  
Baker, T. W. .... Rochester  
Balcome, M. M. .... St. Paul  
Balfour, D. C. .... Rochester  
Bannick, E. G. .... Rochester  
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Bardon, Richard. .... Duluth  
Bargen, J. A. .... Rochester  
Barker, N. W. .... Rochester  
Barnes, A. R. .... Rochester  
Barnes, I. A. .... Duluth  
Barr, W. H. .... Wells

Barrett, E. E. .... Floodwood  
Barrow, Moses. .... Minneapolis  
Barry, L. W. .... St. Paul  
Barsness, Nellie. .... St. Paul  
Basinger, H. P. .... Windom  
Basinger, H. R. .... Mountain Lake  
Bass, G. W. .... Minneapolis  
Bates, B. V. .... Browns Valley  
Baxter, S. H. .... Minneapolis  
Bayard, H. F. .... Minneapolis  
Bayley, E. C. .... Lake City  
Beadie, W. D. .... Cannon Falls  
Beals, Hugh. .... St. Paul  
Beard, A. H. .... Minneapolis  
Beard, R. O. .... Minneapolis  
Beaver, D. C. .... Rochester  
Beckman, W. G. .... Minneapolis  
Bedard, R. E. .... Rochester  
Bedford, E. W. .... Minneapolis  
Beede, Ethel R. .... Fairbault  
Behmler, F. W. .... Appleton  
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Bendix, L. H. .... Annandale  
Benedict, W. L. .... Rochester  
Benepe, J. L. .... St. Paul  
Benham, E. W. .... Mankato  
Benjamin, A. E. .... Minneapolis  
Benjamin, E. G. .... Minneapolis  
Benjamin, W. G. .... Pipestone  
Benn, F. G. .... Minneapolis  
Bennion, P. H. .... St. Paul  
Benoit, F. T. .... Winona  
Bentley, N. P. .... St. Paul  
Berdez, G. L. .... Duluth  
Bergan, Otto. .... Clinton  
Berger, A. G. .... Minneapolis  
Bergh, N. N. .... Montevideo  
Bergheim, M. C. .... Hawley  
Bergish, L. V. .... Owatonna  
Bergman, O. B. .... St. James  
Bergquist, K. E. .... Duluth  
Berkman, D. M. .... Rochester  
Berkman, J. M. .... Rochester  
Berkwitz, N. J. .... Minneapolis  
Bernard, B. C. .... Thief River Falls  
Bernstein, W. C. .... New Richland  
Berrisford, P. D. .... St. Paul  
Bertelson, O. L. .... Crookston  
Bessesen, A. N., Jr. .... Minneapolis  
Bessesen, D. H. .... Minneapolis  
Bessesen, W. A. .... Minneapolis  
Betlach, C. I. .... Rochester  
Beuning, J. B. .... Albany  
Bianco, A. J. .... Duluth  
Bieck, J. F. .... St. Paul  
Biedermann, R. .... Thief River Falls  
Bigelow, C. E. .... Dodge Center  
Billings, R. E. .... Franklin  
Binet, H. E. .... Grand Rapids  
Binger, H. E. .... St. Paul  
Binger, M. W. .... Rochester  
Birnborg, T. L. .... St. Paul  
Black, William. .... Mankato  
Blacklock, S. S. .... Hibbing  
Blake, James. .... Hopkins  
Blake, T. W. .... Rochester  
Blakely, C. C. .... Barnum  
Blakey, A. R. .... Osakis  
Blanchard, H. G. .... Fairmont  
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Blomberg, W. R. .... Aitkin  
Blum, B. B. .... Rochester  
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Boline, C. W. .... Battle Lake  
Bolsta, Charles. .... Ortonville  
Roman, P. G. .... Duluth  
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Boothby, W. M. .... Rochester  
Boreen, C. A. .... Minneapolis  
Borg, J. F. .... St. Paul  
Borgerson, A. H. .... Sebeka  
Borgeson, E. J. .... Minneapolis  
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Bossert, C. E. .... Mora  
Bossingham, O. N. .... Lake Benton  
Bottolfson, B.T. .... Moorhead  
Bouma, L. R. .... St. Paul

Bouman, H. A. H. .... Minneapolis  
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Bowers, J. T. .... Bemidji  
Bowling, H. H. .... Rochester  
Boyd, L. H. .... Alexandria  
Boyer, S. H., Jr. .... Duluth  
Boyer, S. H., Sr. .... Duluth  
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Boysen, Herbert. .... Welcome  
Boysen, Peter. .... Pelican Rapids  
Braasch, W. F. .... Rochester  
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Brand, G. D. .... St. Paul  
Brand, W. A. .... Redwood Falls  
Branton, A. F. .... Willmar  
Branton, B. J. .... Willmar  
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Bratrud, O. E. .... Thief River Falls  
Bratrude, E. J. .... St. James  
Braverman, N. J. .... Duluth  
Bray, C. W. .... Biwabik  
Bray, R. R. .... St. Paul  
Bray, P. N. .... St. James  
Bregel, F. L. .... Duluth  
Brekke, H. J. .... Stillwater  
Brey, F. W. .... Wahasso  
Briggs, J. F. .... St. Paul  
Brigham, C. F. .... St. Cloud  
Brigham, Frank. .... Watkins  
Brink, A. A. .... Baudette  
Brink, J. R. .... Rochester  
Broders, A. C. .... St. Paul  
Brodie, W. D. .... Rochester  
Broker, W. S. .... Battle Lake  
Brooks, C. N. .... Minneapolis  
Brooks, G. F. .... Stillwater  
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Brown, A. H. .... Pipestone  
Brown, E. D. .... Minneapolis  
Brown, E. L. .... St. Paul  
Brown, E. J. .... Minneapolis  
Brown, G. E. .... Rochester  
Brown, J. C. .... St. Paul  
Brown, L. L. .... Crookston  
Brown, P. W. .... Rochester  
Brown, R. W. .... Cambridge  
Brownstone, Manuel. .... Sandstone  
Brunsting, L. A. .... Rochester  
Brusegard, J. F. .... Red Wing  
Brust, J. C. M. .... Syracuse, N. Y.  
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Buchtel, H. A. .... Rochester  
Buck, F. H. .... Shakopee  
Buie, L. A. .... Rochester  
Bulley, Kenneth. .... Minneapolis  
Bullard, Mattie J. .... Minneapolis  
Bullen, F. W. .... Hibbing  
Burch, F. E. .... St. Paul  
Burch, H. A. .... Rochester  
Burnap, G. H. .... St. Paul  
Burns, F. L. .... Fergus Falls  
Burns, H. A. .... Ah-Gwah-Ching  
Burns, H. D. .... Albert Lea  
Burns, M. A. .... Milan  
Burns, R. M. .... St. Paul  
Burton, C. G. .... St. Paul  
Buscher, J. C. .... St. Cloud  
Busher, H. H. .... St. Paul  
Butler, John. .... Minneapolis  
Butsch, W. L. .... Rochester  
Butt, H. R. .... Rochester  
Button, A. J. .... Pine River  
Butturff, C. R. .... Freeborn  
Butz, J. A. .... Triumph  
Butzer, J. A. .... Mankato  
Buzzelle, L. K. .... Minneapolis

Cable, M. L. .... Minneapolis  
Cabot, C. M. .... Rochester  
Cabot, G. B. .... Minneapolis  
Cabot, Hugh. .... Rochester  
Cabot, V. S. .... Minneapolis  
Cady, L. H. .... Minneapolis  
Caine, C. E. .... Morris  
Caldwell, J. P. .... St. Paul  
Caley, G. R. .... Princeton  
Calhoun, F. W. .... Albert Lea  
Callahan, F. F. .... Pokegama  
Callierstrom, G. W. .... Minneapolis  
Cameron, Isabell. .... Minneapolis  
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Camp, W. E. .... Minneapolis  
Campbell, J. E. .... So. St. Paul  
Campbell, L. M. .... Minneapolis  
Campbell, O. I. .... Minneapolis  
Canfield, W. W. .... Houston  
Canwell, W. F. .... International Falls  
Cardie, A. E. .... Minneapolis  
Carey, J. C. .... Minneapolis  
Carlaw, C. M. .... Minneapolis  
Carlson, C. E. .... Stephen

Carlson  
Carlson  
Carlson  
Carman  
Caron  
Carow  
Carroll  
Carsten  
Carte  
Catin  
Catin  
Cavan  
Cerven  
Chadbo  
Chadbo  
Chambe  
Chapma  
Chatter  
Cherry  
Chesley  
Christe  
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Clark  
Clark  
Clark  
Clay, F  
Clayton  
Claydor  
Claydon  
Clemen  
Clemen  
Clifford  
Coate  
Coatrac  
Coffey  
Colby  
Cole, J  
Cole, J  
Cole, J  
Collie  
Collins  
Collins  
Collins  
Collins  
Combac  
Condit  
Conner  
Connor  
Cook, I  
Cook, I  
Cooney  
Cooper  
Corbett  
Cornica  
Corriga  
Cosgrif  
Cosman  
Cottam  
Counse  
Countr  
Covell  
Covent  
Cower  
Crafts  
Cragg  
Craig  
Cranm  
Cranst  
Creery  
Cremen  
Crensh  
Cress  
Cress  
Cress  
Cricht  
Crown  
Culliga  
Culver  
Cummy  
Curry  
Curtin  
Curtis  
Cuts  
Cuts  
Dack  
Dady  
Dahl  
Dahl  
Dahl  
Daign  
Daniel

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Carlson, Vernon	Bloomington	Danielson, J. B.	Litchfield	Elmer, J. R.	Glenwood
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Carow, T. M.	Rochester	Daugherty, E. B.	St. Paul	Emerson, E. C.	St. Paul
Carroll, W. C.	St. Paul	Daugherty, L. E.	St. Paul	Emmerson, W. S.	Mayer
Carstens, C. F.	Hibbing	Davenport, L. H.	Rochester	Emmett, J. L.	Rochester
Carter, F. G.	St. Paul	Davis, A. C.	Rochester	Endress, E. K.	St. Paul
Catlin, J. J.	Buffalo	Favis, B. F.	Duluth	Engberg, E.	St. Paul
Cattin, T. J.	Buffalo	Favis, F. U.	St. Paul	Engel, E.	Eastland
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Chadbourne, A. G.	Heron Lake	Davis, J. C.	Minneapolis	Engstrom, G. F.	Belgrade
Chadborn, C. R.	Janesville	Davis, L. T.	Wadena	Eppard, R. M.	Cloquet
Chambers, W. C.	Blue Earth	Davis, P. L.	Rochester	Erb, F. A.	Minneapolis
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Christenson, C. R.	Minneapolis	Dedolph, T. H.	Braham	Ernest, G. C.	St. Paul
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Christianson, H. W.	Minneapolis	Delmore, J. L.	Roseau	Esheby, E. C.	St. Paul
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Christie, R. K.	Long Prairie	Demo, P. W.	Wells	Estrem, C. O.	Fergus Falls
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Clark, T. C.	Minneapolis	Devereaux, T. J.	Wayzata	Everts, A. B.	Rochester
Clay, F. H.	St. Charles	Dewey, D. H.	Owatonna	Ewald, R. P.	Newport
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Claydon, H. E.	Zumbrota	Diehl, H. S.	Minneapolis	Ewing, C. F.	Wheaton
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Clement, T. G.	Duluth	Dittman, G. C.	St. Paul		
Clifford, G. W.	Osakis	Dixon, C. F.	Rochester	Faber, J. E.	Rochester
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Cole, J. G.	Redwood Falls	Doolittle, L. E.	Duluth	Fawcett, T. H., Jr.	Rochester
Cole, W. H.	St. Paul	Dordal, J.	Sacred Heart	Fawcett, C. E.	Renville
Collie, H. G.	St. Paul	Dorge, R. I.	Minneapolis	Fawcett, A. M.	Duluth
Collins, A. N.	Duluth	Dornblaser, H. B.	Minneapolis	Fawcett, K. R.	Stewartville
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Collins, H. C.	Duluth	Dorsey, J. M.	Rochester	Fellows, M. F.	Duluth
Collins, J. S.	Wabasha	Dovre, C. M.	St. Paul	Fenger, E. P. K.	Oak Terrace
Colvin, A. R.	St. Paul	Dowsell, W. J.	Kerkhoven	Ferguson, J. C.	St. Paul
Combacher, L. C.	Fergus Falls	Doxey, G. L.	Minneapolis	Ferguson, H. H.	St. Paul
Comfort, M. W.	Rochester	Doyle, D. L.	Duluth	Fetterly, Warren	Minneapolis
Condit, W. H.	Minneapolis	Doyle, L. O.	Minneapolis	Feuling, John	Bovey
Conner, H. M.	St. Paul	Drake, C. B.	St. Paul	Fiala, M. J.	Duluth
Connor, C. E.	Rochester	Drake, C. R.	Minneapolis	Figi, F. A.	Rochester
Cook, N. E.	Rochester	Drake, F. A.	Lanesboro	Fiskdal, M. J.	Willmar
Cook, H. W.	Minneapolis	Dredge, H. P.	Sandstone	Fine, B. A.	Winsted
Cook, J. M.	Staples	Drenning, F. C.	Duluth	Fink, L. W.	Minneapolis
Cooney, H. C.	Princeton	Drill, H. E.	Hopkins	Fink, W. K.	Shakopee
Cooper, M. D.	Winnebago	Drips, D. L.	Rochester	Fischer, H. P.	Duluth
Cooperman, H. O.	Minneapolis	Drought, W. W.	Fergus Falls	Fischer, M. McC.	Duluth
Corbett, J. F.	Minneapolis	Dry, T. J.	Rochester	Fischer, P. M.	Shakopee
Cornica, A. J.	Minneapolis	Dubbe, F. H.	New Ulm	Fisher, Laura M.	Rochester
Corrigan, J. E.	Spooner	DuBois, J. A.	Sauk Center	Fitzgerald, D. F.	Minneapolis
Cosgriff, J. A.	Bird Island	DuBois, J. F.	Sauk Center	Fitzgerald, E. T.	Morris
Cosman, E. O.	Minneapolis	Dudley, J. H.	Windom	Fjeldstad, C. A.	Minneapolis
Costello, R. T.	Rochester	Duff, E. R.	Minneapolis	Fagan, H. F.	St. Paul
Cottam, G. G.	Minneapolis	Dugan, L. S.	Fairbault	Flanagan, I. G.	Austin
Cottrell, V.	St. Paul	Dulude, S.	Dassel	Flanchar, L. H.	Lake Park
Cottrell, V.	St. Paul	Dumas, A. G.	Minneapolis	Fleischhauer, D. S.	Wabasha
Cottrell, V.	St. Paul	Duncan, J. W.	Moorhead	Flesche, B. A.	Lake City
Cottrell, V.	St. Paul	Dungay, N. S.	Northfield	Flinn, T. E.	Redwood Falls
Cottrell, V.	St. Paul	Dunlap, E. H.	Minneapolis	Flores, O. T.	Dodge Center
Cottrell, V.	St. Paul	Dunn, G. R.	Minneapolis	Fogarty, C. W.	St. Paul
Cottrell, V.	St. Paul	Dunn, J. N.	St. Paul	Fogelberg, E. J.	St. Paul
Cottrell, V.	St. Paul	Durgin, F. W.	Winnebago	Foley, M. P.	St. Paul
Cottrell, V.	St. Paul	Duryea, Marbury	Minneapolis	Foley, M. P.	Rochester
Cottrell, V.	St. Paul	Duryea, W. M.	Minneapolis	Folken, F. G.	Albert Lea
Cottrell, V.	St. Paul	Dutton, C. E.	Minneapolis	Folta, John	Ceylon
Cottrell, V.	St. Paul	Dvorak, B. A.	Minneapolis	Ford, B. C.	Marshall
Cottrell, V.	St. Paul	Dwan, P. F.	Minneapolis	Ford, W. H.	Minneapolis
Cottrell, V.	St. Paul	Dworsky, S. D.	Minneapolis	Foshager, H. T.	Clara City
Cottrell, V.	St. Paul	Dysterheft, A. F.	Gaylord	Foster, F. P.	Rochester
Cottrell, V.	St. Paul			Foster, F. P.	Rochester
Cottrell, V.	St. Paul			Foster, W. K.	Minneapolis
Cottrell, V.	St. Paul			Fowler, L. H.	Minneapolis
Cottrell, V.	St. Paul			Franchere, F. W.	Lake Crystal
Cottrell, V.	St. Paul			Francis, D. W.	Fairbault
Cottrell, V.	St. Paul			Frary, Louise G.	Minneapolis
Cottrell, V.	St. Paul			Fredericks, G. M.	Minneapolis
Cottrell, V.	St. Paul			Fredrickson, Alice C.	Lake Lillian
Cottrell, V.	St. Paul			Friedland, J. C.	St. Paul
Cottrell, V.	St. Paul			Freeman, C. D.	St. Paul
Cottrell, V.	St. Paul			Freeman, G. H.	St. Peter
Cottrell, V.	St. Paul			Freeman, J. P.	Albert Lea
Cottrell, V.	St. Paul			Freeman, W. L.	St. Cloud
Cottrell, V.	St. Paul			Freigh, W. P.	Albert Lea
Cottrell, V.	St. Paul			Friedel, R. E.	Rochester
Cottrell, V.	St. Paul			Friedel, Aaron	Minneapolis
Cottrell, V.	St. Paul			Friedland, J. C.	St. Paul
Cottrell, V.	St. Paul			Frisch, F. P.	Willmar
Cottrell, V.	St. Paul			Fritsche, Albert	New Ulm
Cottrell, V.	St. Paul			Fritsche, C. J.	New Ulm
Cottrell, V.	St. Paul			Froats, C. W.	Thief River Falls

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Mark, Hilbert . . . . . Ah-Gwah-Ching

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		Noth, H. W.	Minneapolis		

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Simons, E. J.	Swanville
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Torgerson, W. B.	Oklee		
Tovell, R. M.	Rochester		

\*Deceased.